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Fish Kills Caused by Pollution in 1971
Twelfth Annual Report

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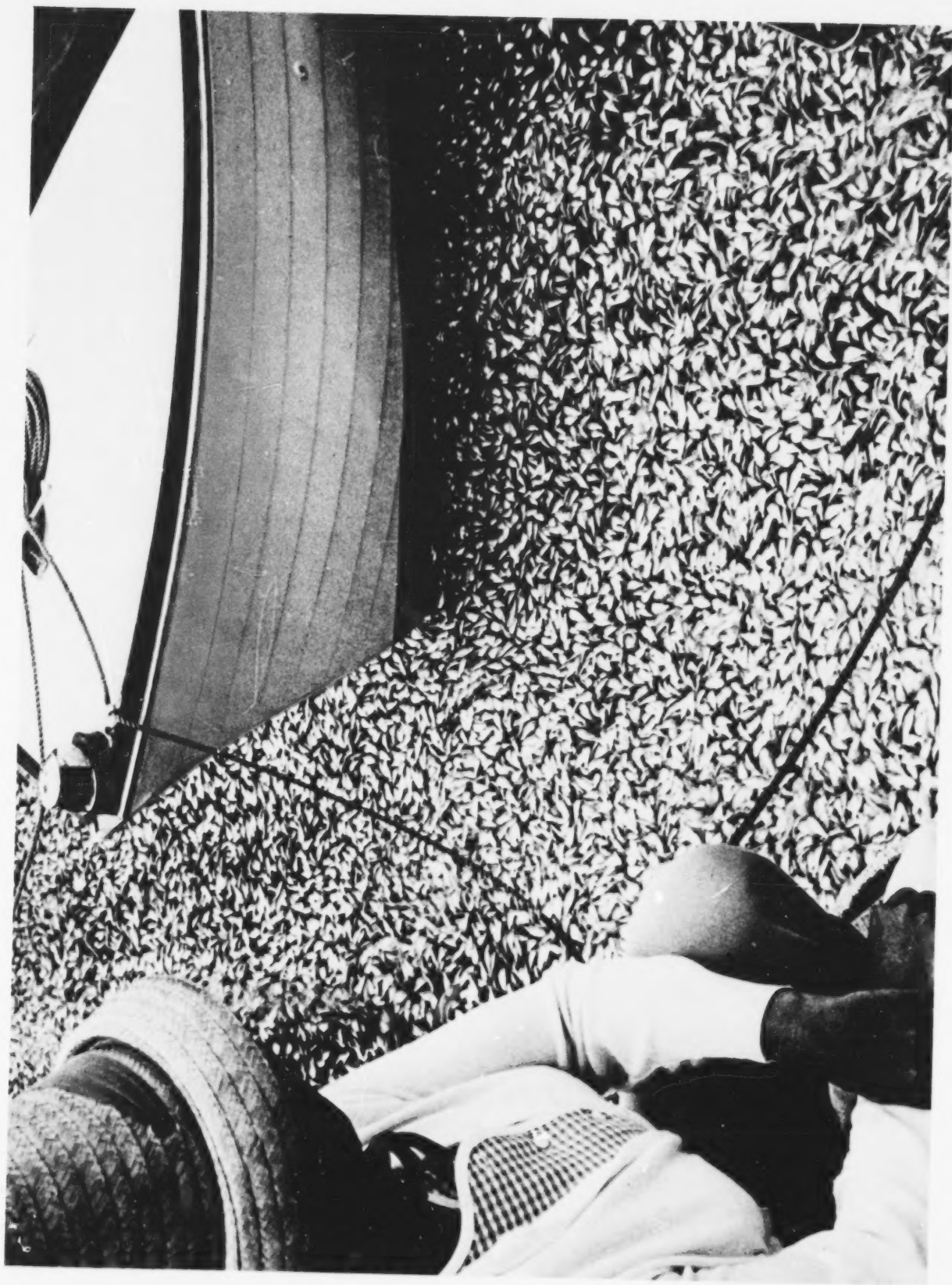
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FISH KILLS CAUSED BY POLLUTION IN 1971



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1971 FISH KILLS · TWELFTH ANNUAL REPORT



OFFICE OF AIR AND WATER PROGRAMS
MONITORING AND DATA SUPPORT DIVISION
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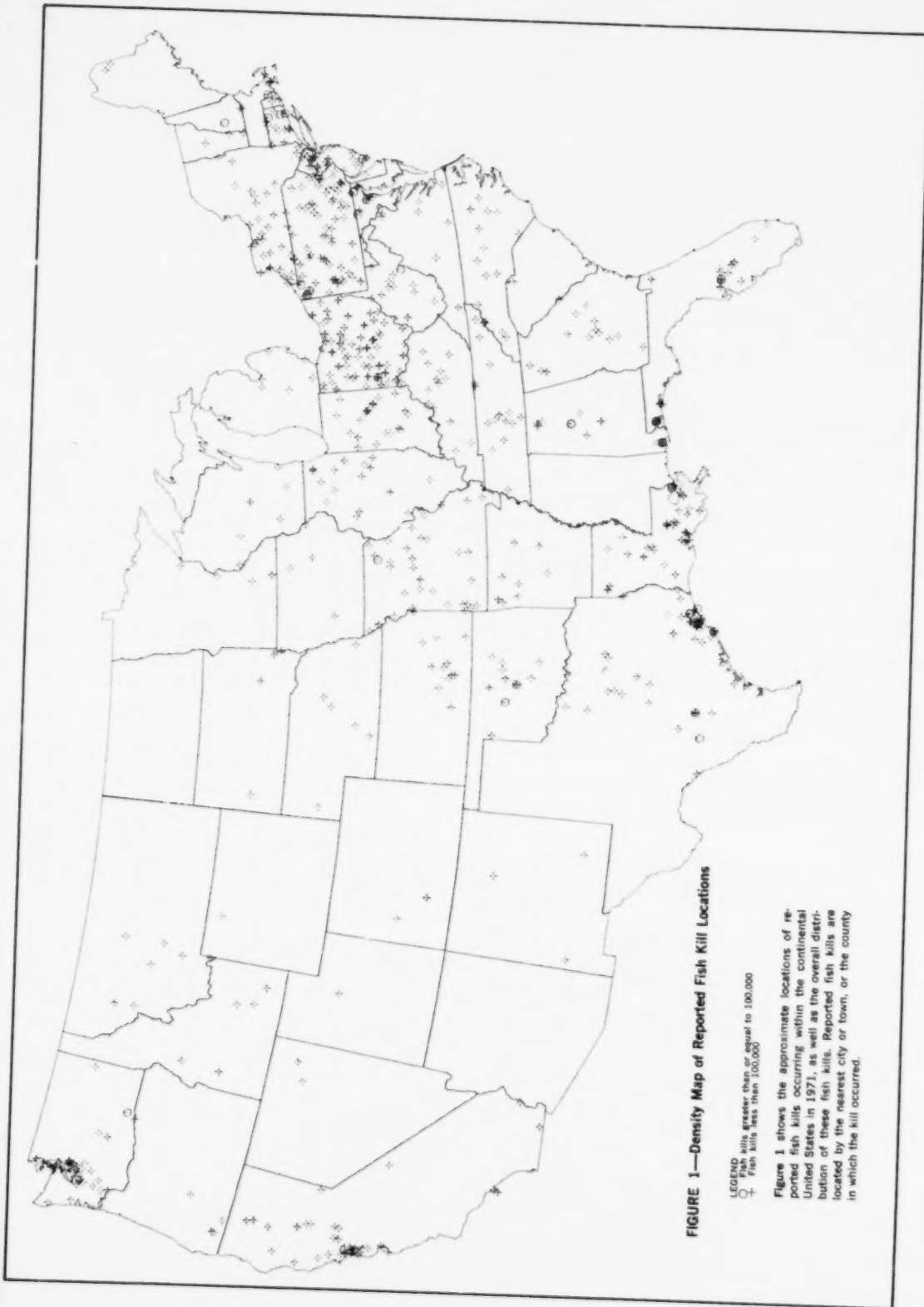
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Foreword . . .

The annual fish kill report represents the combined efforts of private individuals; State fish and game, health, and conservation officers; and water pollution control officials at the State and Federal level. Usually, a fish kill is first noticed by a fisherman, camper, or other private citizen, who initiates the reporting process by contacting a warden or other State official. The State agency then sends trained specialists to investigate and identify the cause and size of the kill. Where water pollution is determined or suspected to be the cause, the State submits a report to the Environmental Protection Agency.

The annual fish kill report cannot be considered complete, since numerous kills go unnoticed or unreported.

At this time, it is appropriate to recognize the dedication and effort devoted to the annual fish kill report by Mr. James R. Harlan, Conservationist, who retired recently from the Office of Air and Water Programs, Environmental Protection Agency. His significant contributions to the report extend from its inception in 1960 through this current publication.



Summary

Significant Statistics of Fish Kills Reported in 1971

- **73.7 Million Fish Reported Killed by Pollution in 1971!**

The number of fish reported killed by pollution in 1971 is greater by 81 percent than the number reported in any previous year on record (beginning 1960). The second largest number was reported in 1969, when the toll was 41 million. The data do not indicate whether this is due to better reporting by a concerned public or to greater fish kills.

- **One Million or More Fish Reported Killed by Pollution in Each of 28 Incidents in 1971!**

The number of fish kills reported in 1971 which involved the death of one million or more fish almost equals the total number of kills of this size (31) reported from June 1960 through 1970.

- **860 Reports of Pollution-Caused Fish Kills in 1971 Tops Previous Annual High (1970) by 226 Reports!**

The number of reports continues to increase annually at a rate indicated by the doubling in 1971 of the number received in 1967.

- **659 Pollution-Caused Fish Kill Incidents in 1971 Occurred in the Eastern Half of the Continental United States!**

Of the 820 reported fish kills in the continental United States, 659, or 79 percent, occurred east of the boundaries of Texas, Oklahoma, Kansas, Nebraska, and the Dakotas.

- **56.4 Million Fish Were Killed in Estuarine Waters in 1971!**

For the first time since the annual report was started in 1960, more fish were reported killed in estuarine waters than in fresh or salt water. The large number killed in 1971 is primarily due to a number of large kills totaling 31.4 million fish which were reported in two localized bay areas, one in Florida and one in Texas.

- **24.8 Million Fish Reported Killed by Pollution From Municipal Operations in 1971!**

Pollution from municipal sources, principally sewerage systems, caused, for the third time in the history of the report, the death of more fish than any other major source of pollution. In 1971, industrial operations led all other major sources of pollution in reported incidents (231) for the twelfth consecutive year.

- **63.7 Million Fish Were Reported Killed by Pollution from May through September, 1971!**

The warm weather months May through September accounted for 71.2 percent of the total reported pollution-caused fish kill incidents in 1971. The 147 kills occurring in July is the highest number reported for any month since the inception of the annual fish kill report.

Detailed Analyses of 1971 Reports

Basic Statistics

A density map of reported 1971 fish kill incidents in the continental United States (Figure 1) shows the distribution throughout the country.

The total of 860 reports in 1971 (Table 1) shows a 36 percent increase over 1970. It is impossible to say whether this represents a true increase in the number of incidents or whether it results from increased awareness and interest of the many people, starting with the casual observer, involved in the reporting chain.

Sources of pollution were identified in 641 of the 860 reported incidents. These kills are listed individually in Table 10. The 219 kills for which the source could not be identified are listed in Table 11.

Total Fish Reported Killed

Of the 860 reports submitted, 757 contained estimates of the number of fish killed (Table 2). In the remaining 103 reports, fish losses were expressed in general terms such as thousands or pounds. These 103 reports were assigned values based on averages

Table 1 contains historical data for the twelve years that the annual fish kill report has been published. The table summarizes the number of estimated fish killed, the number of states reporting fish kills, the number of reports indicating size of fish kill, and other supporting information.

TABLE 1—Historical Summary of Pollution-Caused Fish Kills, June 1960—December 1971

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Number of States reporting	38	45	37	38	40	44	46	40	42	45	45	46
Number of reports	286	411	381	436	485	531	456	375	438	465	634	860
Reports which state number of fish killed	149	263	213	300	385	446	372	303	379	482	560	757
Total estimated number of fish killed ¹	6,379,000	15,910,000	7,118,000	7,860,000	18,387,000	11,784,000	9,115,000	11,591,000	15,236,000	41,004,000	22,760,000	74,287,000
Average size of kill ²	2,925	6,535	5,710	7,775	5,490	4,310	5,620	6,460	6,015	5,860	6,412	6,154
Largest kill reported	5,000,000	5,387,000	3,180,000	2,000,000	7,887,000	3,000,000	1,000,000	6,549,000	4,029,000	26,527,000	3,240,000	5,500,000
Reports where extent of area affected was stated												
River:												
Number of reports	189	240	259	271	339	292	251	219	264	356	487	705
Miles of stream	1,204	1,686	1,448	2,203	1,440	1,300	989	1,039	1,555	2,358	3,865	4,187
Lakes and reservoirs:												
Number of reports	25	50	25	49	57	38	46	33	37	98	111	94
Acres affected	1,407	5,967	2,581	5,644	12,637	4,630	21,564	1,996	2,400	6,068	33,168	6,622
Coastal waters: ³												
Number of reports	13	6	9	5	6	9	4	1	6	11	36	61
Miles of coastal waters	51	51	25	7	11	20	16	3	28	113	11,687 ⁴	2,034
Average duration of kill in days	2.95	2.64	2.59	3.18	2.44	2.57	2.71	3.34	2.99	3.11	3.25	3.35

¹ Includes all fish killed reported plus an allowance computed for reports which do not indicate the number of fish that died.

² After adjustment for reports giving two or more causes.

³ Included after excluding reports of 100,000 kills or more as being unrepresentative.

⁴ Includes embayments such as Chesapeake, San Francisco, and Galveston Bays.

⁵ Two incidents off Alaska affected 11,520 acres of coastal waters.

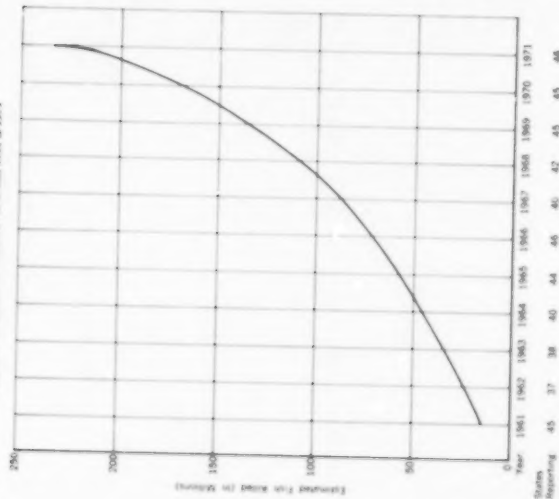
from 703 fish kill reports in which less than 100,000 fish were reported killed. The total of the 757 reports containing fish kill estimates, plus the computed fish kill estimates for the 103 reports brought the 1971 fish kill estimate total to 74,286,923.

The 74.3 million fish estimated killed brought the total number of fish killed (Figure 2) to 235.0 million in 5,452 separate incidents since the first full year of reporting (1961). There were 46 States which submitted at least one fish kill report. The remaining four States—Alaska, Arizona, Mississippi, and North Dakota—did not submit any reports. Massive kills in Florida and Texas (Table 3) accounted for more than 65 percent (47.9 million) of the total number of fish reported killed in 1971.

Major Fish Kills

There were 54 reported kills in which the number of dead fish equaled or exceeded 100,000 each, accounting for 69.4 million fish (Table 4). Of these, 28 kills reached or exceeded the million mark. One million or more fish were killed in: twelve incidents in Florida, totalling 29,000,000 fish; six incidents in Texas, totalling 16,000,000 fish; three incidents in Alabama, totalling 5,500,000 fish; one incident in Washington, killing 5,000,000 fish; two incidents in Connecticut, totalling 3,000,000 fish; one incident in New Jersey, killing 2,000,000 fish; one incident in Maryland and one incident in Massachusetts, killing 1,250,000 fish each; and one incident in Louisiana, killing 1,000,000 fish.

FIGURE 2—Cumulative Estimates of Fish Killed, 1961 to 1971



AN INCREASING RATE OF REPORTED FISH KILLS...

... over an 11 year period is indicated by Figure 2. This graph is a cumulative summary of estimated numbers of fish killed reported for 1961 through 1971. The first reporting year, 1960, was excluded since reports were not received for the full year.

Average Size of Fish Kills

The average size of the 1971 fish kills was 6,154, down from the 1970 average size of 6,412 (Table 2). As in previous annual reports, averages were derived after eliminating as unrepresentative those reports of 100,000 or more fish killed (Table 4). Hence, while the total estimated fish killed

for 1971 was 226 percent greater than the 1970 total, the 1971 average fish kill was 4 percent less than the 1970 average. The 1971 average is obviously a skewed statistic since the number of reports of fish kills exceeding 100,000 amount to only 6 percent of the total reports but account for more than 94 percent of the total fish killed.

Kills caused by transportation operations had the highest average, with 10,106 fish per kill reported, followed by 7,382 fish per kill for industrial operations, 6,068 fish per kill for municipal operations, and 4,714 fish per kill for agricultural operations (Table 2). These averages were also computed excluding kills greater than or equal to 100,000 from the base.

Fish Killed, By Type of Water Body

The 1971 reports indicate a significant decrease in fish reported killed in lakes and a significant increase in fish reported killed in coastal waters including bays such as Chesapeake, San Francisco and Galveston Bays. Only one percent (0.8 million) of the total fish reported killed (Table 5) died in lakes, while 44 percent (32.4 million) died in coastal waters. In 1970, 14 percent (3.1 million) of the total died in lakes, while 27 percent (6.1 million) died in coastal waters. Fish killed in rivers and streams varied slightly between 55 percent (40.4 million) in 1971 and 59 percent (13.1 million) in 1970.

Fish Killed, By Type of Water

In 1971, the number of fish reported

TABLE 2—Fish Kill Summary by Source of Pollution, 1971

Source of pollution	Total reports	Reports specifying number of fish killed		Average kill ^a	Estimated fish killed ^b		
		No. of reports	No. of fish		Total	Game	Non-game
Agricultural:							
Pesticides	75	63	264,504				
Fertilizers	11	8	65,760				
Manure-silage drainage	46	41	693,073				
Subtotal	132	112	1,023,337	4,714	1,117,617	354,284	763,333
Industrial:							
Mining	30	25	220,758				
Food products	25	20	72,037				
Paper products	10	8	45,805				
Chemicals	49	47	2,400,060				
Petroleum	29	22	230,900				
Metals	24	22	284,604				
Combinations	9	9	1,119,877				
Other	55	46	278,351				
Subtotal	231	199	4,652,392	7,382	4,888,616	645,297	4,243,319
Municipal:							
Sewerage systems	133	111	21,352,390				
Refuse disposal	5	3	81,202				
Water systems	12	11	86,334				
Swimming pool	3	3	930				
Power	9	9	3,277,576				
Subtotal	162	137	24,798,432	6,068	24,950,132	2,420,162	22,529,970
Transportation:							
Rail	13	12	210,693				
Truck	30	28	441,157				
Barge or boat	1	1	7,500				
Pipeline	8	7	4,830				
Subtotal	52	48	664,180	10,106	704,604	172,627	531,977
Other operations:	64	60	7,257,478	2,464	7,267,334	5,297,886	1,969,448
Unknown:	219	201	35,257,226	5,633	35,358,620	141,434	35,217,186
Total:	860	757	73,653,045	6,154	74,286,923	9,031,690	65,255,233

^a Derived after excluding 54 reports of 100,000 kills or more as being unrepresentative.

^b Includes all fish killed plus an allowance computed for reports which did not indicate the number of fish that died. Note: Insufficient data available to make a reliable estimate of the number of fish of commercial value that died.

killed in estuary-type water (water of inlets, bays, or river mouths that are affected by tidal action) increased considerably over the number reported killed in 1970.

In 1971, 77 percent (56.4 million) of the total reported fish were killed in estuary-type water (Table 6) as compared to 44 percent (9.8 million) in 1970; about 20 percent of the fish (15.2 million) were killed in fresh water (inland water upstream of tidal action) as compared to 54 percent (12.0 million) in 1970, showing a significant decrease; and 3 percent of the fish (2.0 million) were killed in salt water (water beyond the coastline) as compared to 2 percent (0.5 million) in 1970.

The increase of fish killed in estuary-type water could be of great national concern since estuaries serve as nursery grounds for many species of marine fish. In this report, however, the large increase over the previous year results from a number of massive kills localized principally in the Escambia Bay, Florida, and the Galveston Bay, Texas, areas. Interpretation as a national trend, therefore, is not in order.

Fish Kills, By Month

As in the past, the greatest number of fish kills occurred during the summer months (Table 7). Warm water and low river stages from May through September enhanced the

Table 2 summarizes 1971 fish kills by major and individual pollution sources, and provides further information on fish killed in the game and non-game categories by major pollutional sources. Average size of fish kill for each major source is also included.

pollutional effect by increasing pollutant concentrations through lower water stages, or decreasing dissolved oxygen due to increased water temperature. Almost 86 percent of the 73.6 million fish reported killed in 1971 were killed from May through September. July had the greatest number of fish kill reports (147) with almost 18 million fish killed, based on 134 reports which specified the number of fish killed. August ranked second in number of fish kill reports (145), but showed the greatest loss for a single month with 20.5 million fish based on 130 reports giving the number killed. September ranked third in number of fish kill reports (136) with 19.6 million fish killed based on 122 reports giving the number killed. June ranked fourth in number of fish kill reports (108) with 4.1 million fish killed based on 95 reports giving the number killed. May ranked fifth in number of fish kill reports (76) with 1.6 million fish killed based on 64 reports giving the number killed.

Fish Kills, By Duration

All reports do not indicate duration of kill. In 1971, 58 percent (503 reports) indicated duration of kill with an average of 3.35 days (Table 1). In 1970, 84 percent

Table 3 summarizes fish kills in 46 reporting States. Of the 860 reports, 757 indicated the number of fish killed. The remaining 103 reports estimated losses in such general terms as "thousands of fish" and "pounds." This table also shows a state-by-state breakdown of the number of fish reported killed and water surfaces affected.

TABLE 3—Pollution-Caused Fish Kill Summary by State, 1971

TABLE 3—Pollution-Caused Fish Kill Summary by State, 1971									
State	Total reports	Reports specifying number of fish killed		Number of reports and water surfaces affected					
		Num-ber of reports	Number of fish	River		Lake		Coastal waters*	
Alabama	20	20	6,012,387	13	65	7	30		
Arkansas	9	8	111,504	9	30				
California	39	37	72,605	29	68	5	1,532	5	60
Colorado	3	3	41,600	3	15				
Connecticut	13	12	3,133,900	12	24				
Delaware	1	1	1,250	1				1	
Florida	62	60	31,676,761	9	420	9	1,186	44	949
Georgia	16	15	56,000	10	50	6	32		
Hawaii	12	11	18,090	8	7	2	2	2	2
Idaho	6	5	18,012	4	10	2	11		
Illinois	18	17	408,999	17	90	1	4		
Indiana	24	20	33,021	24	104				
Iowa	6	6	125,000	5	28	1	5		
Kansas	13	13	53,335	11	26	2			
Kentucky	15	10	61,590	15	48				
Louisiana	50	42	1,191,630	44	191	5	215	1	1,000
Maine	2	1	400	2	1				
Maryland	12	10	1,582,826	9	799	1	10	2	2
Massachusetts	5	4	1,255,902	2	3	3	9		
Michigan	6	5	59,375	6	11				
Minnesota	5	5	16,350	5	15				
Missouri	37	29	555,789	34	131	3	8		
Montana	3	3	9,280	7	15				
Nebraska	6	5	11,645	4	23	2	2		
Nevada	2	1	15,000	2	10				
New Hampshire	3	2	105,000	2	4	1	182		
New Jersey	28	25	2,016,475	15	19	13	48		
New Mexico	3	3	9,250	3	43				
New York	38	38	242,935	37	92	1	1		
North Carolina	16	14	78,262	15	757	1	6		
Ohio	134	107	1,248,351	132		2			
Oklahoma	11	11	490,345	10	193	1	3,200		
Oregon	4	4	1,386	4	5				
Pennsylvania	81	78	1,091,424	78	255	3	32		
Rhode Island	2	2	300	1	1	1			
South Carolina	1								
South Dakota	3	3	10,300	1	12	1	10		
Tennessee	18	18	277,625	16	31	2	4		
Texas	59	52	16,216,075	47	358	8	27	4	15
Utah	1	1	110	1					
Vermont	4	4	40,500	4	9				
Virginia	11	8	47,141	7	33	4	24		
Washington	31	22	5,026,721	24	103	5	9	2	6
West Virginia	13	13	210,054	12	51	1	3		
Wisconsin	9	8	6,530	8	27	1	30		
Wyoming	1	1	12,000	1	3				
Total	860	757	73,653,045	705	4,187	94	6,622	61	2,034

* Includes embayments such as Chesapeake, San Francisco, and Galveston Bays.

* Includes embayments such as Chesapeake, San Francisco, and Galveston Bays.

TABLE 4—Major Kills—100,000 or Over—1971

Lake or stream	Near or in	State	Number of fish	Operation
Locust Fork	Birmingham	Alabama	1,000,000	Combination
Valley Creek	Gilmore	Alabama	2,500,000	Sewerage system
Esauva Cr.-Dog R.	Mobile	Alabama	2,030,035	Sewerage system
Industrial Canal	Mobile	Alabama	403,780	Sewerage System
Thames River	Montville	Connecticut	100,000	Unknown
Millstone Point	Norwich	Connecticut	1,000,000	Sewerage System
Banana Lake	Waterford	Florida	2,000,000	Power
Bass Hole Cove	Lakeland	Florida	273,100	Sewerage System
Bass Hole Cove	Santa Rosa Co	Florida	3,000,000	Unknown
E Shore-Escambia	Santa Rosa Co	Florida	2,000,000	Unknown
Escambia Bay	Santa Rosa Co	Florida	2,000,000	Unknown
Escambia Bay	Santa Rosa Co	Florida	5,500,000	Unknown
Escambia River	Santa Rosa Co	Florida	150,000	Unknown
Judges Bayou	Santa Rosa Co	Florida	250,000	Unknown
Judges Bayou	Santa Rosa Co	Florida	250,000	Unknown
Judges Bayou	Santa Rosa Co	Florida	2,000,000	Unknown
Judges Bayou-ESC	Santa Rosa Co	Florida	2,500,000	Unknown
Judges Bayou-ESC	Santa Rosa Co	Florida	2,500,000	Unknown
Mulatto Bayou	Santa Rosa Co	Florida	2,000,000	Unknown
Mulatto Bayou	Santa Rosa Co	Florida	2,000,000	Unknown
Mulatto Bayou	Santa Rosa Co	Florida	2,000,000	Unknown
Mulatto Bayou-CA	Santa Rosa Co	Florida	250,000	Unknown
N Escambia Bay	Santa Rosa Co	Florida	2,000,000	Unknown
Saltzman Bayou	Santa Rosa Co	Florida	2,000,000	Unknown
Salt Bayou	Santa Rosa Co	Florida	750,000	Unknown
Bear Creek	Slide	Florida	2,000,000	Unknown
Susquehanna Riv.	Baltimore	Louisiana	1,000,000	Sewerage system
Piney Run	Conowingo	Maryland	1,253,516	Metals
Lee River	Taneytown	Maryland	177,550	Power
N Fk Salt River	Somerses	Maryland	113,000	Sewerage system
Kezar Lake	Brashear	Massachusetts	1,222,800	Sewerage system
Bidwells Ditch	North Sutton	Missouri	152,752	Chemicals
Maumee R	Goshen	New Hampshire	100,000	Sewerage system
Great Miami R	Lucas Co	Ohio	2,000,000	Other operations
N Canadian R	Montgomery Co	Ohio	131,245	Sewerage system
Conneaut Creek	Oklaoma City	Oklahoma	548,076	Sewerage system
French Creek	Watonga	Oklahoma	171,370	Chemicals
So Br French Cr	Conneautville	Pennsylvania	132,769	Sewerage system
Oyster Bayou	Meadville	Pennsylvania	100,000	Sewerage system
Trinity River	Union City	Pennsylvania	350,000	Chemicals
Dickinson Bayou	Anahuac	Texas	189,166	Truck transportation
Dickinson Bayou	Dickinson	Texas	1,993,200	Unknown
Dickinson Bayou	Dickinson	Texas	3,000,000	Sewerage system
Freeport Harbor	Dickinson	Texas	2,000,000	Sewerage system
Sun Oil "Slip"	Freeport	Texas	3,000,000	Sewerage system
Sabinal River	Gilchrist	Texas	4,000,000	Sewerage System
San Antonio Riv	Sabinal	Texas	105,600	Other operations
Taylor Bayou	San Antonio	Texas	1,000,000	Unknown
Drainage Canal	Shoreacres	Texas	500,000	Manure drainage
Snake River	Texas City	Texas	100,000	Chemicals
Greenbrier River	Pasco	Texas	300,000	Sewerage system
	Durbin	Washington	150,000	Sewerage system
		West Virginia	5,011,400	Other operations
			120,547	Other industrial

(408 reports) indicated duration with an average of 3.25 days (Table 1). The four longest lasting pollution incidents in 1971 required at least 99 days for all fish to be killed. These incidents occurred at: Millstone Point near Waterford, Connecticut; Beaver Creek near Bellingham, Washington; Snake River near Pascoe, Washington; and Beaver Creek near Ryderwood, Washington.

Table 4 summarizes those fish kill incidents in which 100,000 or more fish were killed in 1971.

Table 5 summarizes fish kills by type of water body (river, lake, and coastal waters); Table 6 summarizes fish kills by type of water, (fresh, salt, and estuary); and Table 7 summarizes fish kills by month.

TABLE 5—Fish Kill Summary by Type of Water Body, 1971

Type of water body	Total reports	Reports specifying number of fish killed	
		Num-ber of reports	Number of fish
River	705	610	40,419,471
Lake	94	90	822,210
Coastal waters*	61	57	32,412,364
Total	860	757	73,653,045

* Includes embayments such as Chesapeake, San Francisco, and Galveston Bays.

TABLE 6—Fish Kill Summary by Type of Water, 1971

Type of water	Total reports	Reports specifying number of fish killed	
		Num-ber of reports	Number of fish
Fresh*	725	630	15,205,913
Salt**	11	7	2,014,914
Estuary***	124	120	56,432,218
Total	860	757	73,653,045

* Fresh water includes any inland water upstream of tidal action.

** Salt water means water beyond the coastline.

*** Estuary means the water of inlets, bays, or river mouths that are affected by tidal action.

TABLE 7—Fish Kill Summary by Month, 1971

Month	Total reports	Reports specifying number of fish killed	
		Num-ber of reports	Number of fish
January	24	19	263,838
February	28	25	111,277
March	38	30	399,957
April	54	46	5,279,224
May	76	64	1,576,873
June	108	95	4,111,714
July	147	134	17,854,512
August	145	130	20,524,479
September	136	122	19,607,229
October	56	51	3,586,161
November	24	22	161,149
December	24	19	176,632
Total	860	757	73,653,045

Fish Kills, By Severity

Measurements of fish kill severity are reported as complete, heavy, moderate, or light (Table 8). One hundred and seven reports of complete kills were reported, averaging 9,426 fish per kill. Heavy kills averaging 9,583 fish were reported on 269 occasions. Moderate kills were reported on 144 occasions, averaging 4,046 fish per kill. Light kills were reported on 160 occasions, averaging 1,082 fish per kill. Table 8 also indicates the average duration of fish kills by severity of kill, as well as the number and percentages of fish kill reports given jointly for severity of kill and major source of pollution.

Table 8 summarizes severity of a fish kill by the number of reports, average size of fish kill, duration of fish kill, and major pollution source operations. In 1971, "heavy" kills occurred most frequently (269 reports), with an average fish kill size of 9,583 and an average duration of 4.44 days based on 199 reports.

TABLE 8—Fish Kill Summary by Severity of Kill, 1971

Severity of kill	Num-ber of reports	Average kill*	Duration of kill		Agricultural		Industrial		Municipal		Transportation		Other Operations		Unknown	
			No.	Average (days)	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent
Complete kill	107	9,426	78	1.79	26	19.0	40	17.0	10	6.0	11	21.0	10	15.0	10	4.0
Heavy kill	269	9,583	199	4.44	38	28.0	69	29.0	59	36.0	19	36.0	17	26.0	67	30.0
Moderate kill	144	4,046	103	2.34	23	17.0	27	11.0	30	18.0	9	17.0	11	17.0	44	20.0
Light kill	160	1,082	106	2.58	16	12.0	43	18.0	20	12.0	6	11.0	18	28.0	57	26.0
Not Stated	180	7,348	17	8.65	29	22.0	52	22.0	43	26.0	7	13.0	8	12.0	41	18.0
Total	860	6,154	503	3.35	132	100.0	231	100.0	162	100.0	52	100.0	64	100.0	219	100.0

* Derived after excluding 54 reports of 100,000 kills or more as being unrepresentative.

Analyses of Pollution— Causing Operations— National Basis

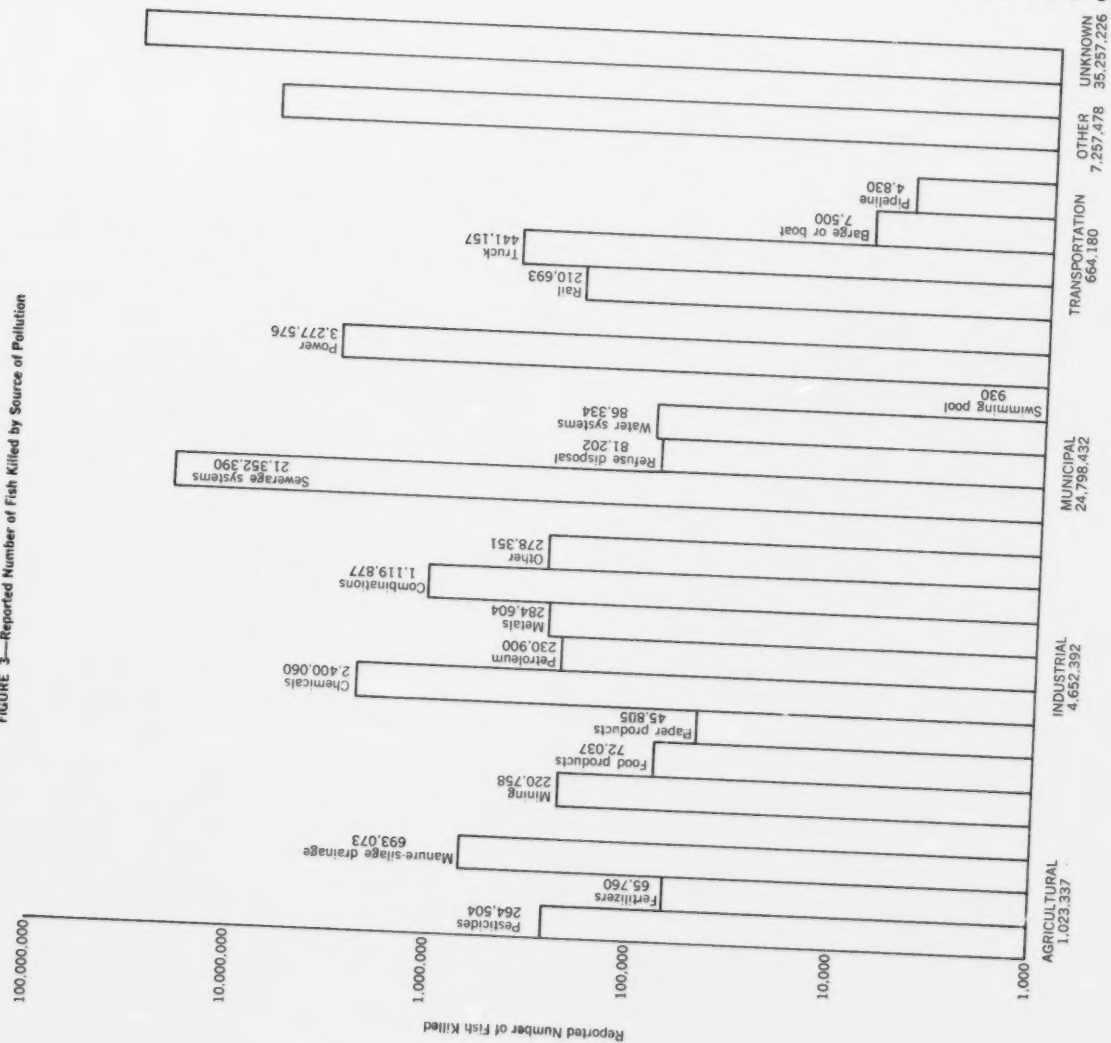
Industrial operations continued to be the most frequent cause of fish kills (Table 2), with 231 reports accounting for 4.9 million fish killed. Pollution from municipal operations was the second most frequent cause, with 162 reports accounting for 25.0 million fish.

In 1971, the number of fish killed by pollution from sewerage systems (21.4 million) led all other individual sources of pollution (Figure 3). The number of reported incidents resulting from pollution from sewerage systems (133) also led all other identifiable sources of pollution (Figure 4). Data from the reported number of fish killed and the number of fish kill reports are not randomized samples of pollution effects in waterways and cannot be given solid statistical interpretations. However, the reported number of fish kills more closely approximates a random sample than the number of fish killed, and provides a more significant measure for analyzing effects of pollution.

Analyses of these and other categories of operations causing pollution are given in the following paragraphs.



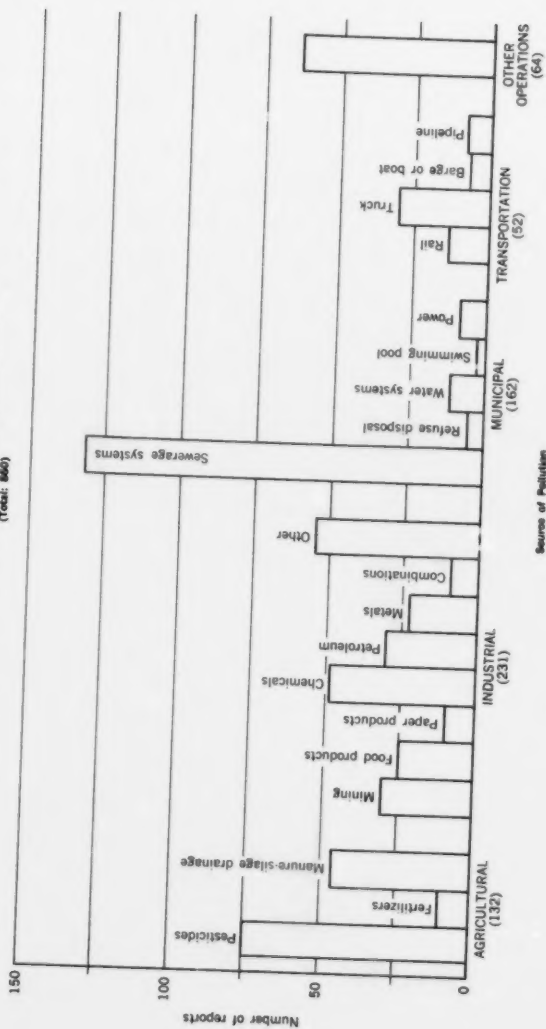
FIGURE 3—Reported Number of Fish Killed by Source of Pollution



OF THE TWENTY-ONE IDENTIFIED SOURCES OF POLLUTION ...

... municipal sewerage systems was the leading killer of fish in 1971. Figure 3 shows the relationship between the reported number of fish killed and the individual sources of pollution. Note that the reported number of fish killed per individual source varies between 930 fish killed per individual from "swimming pool" operations and 21.4 million fish killed by pollution from "sewerage systems" operations.

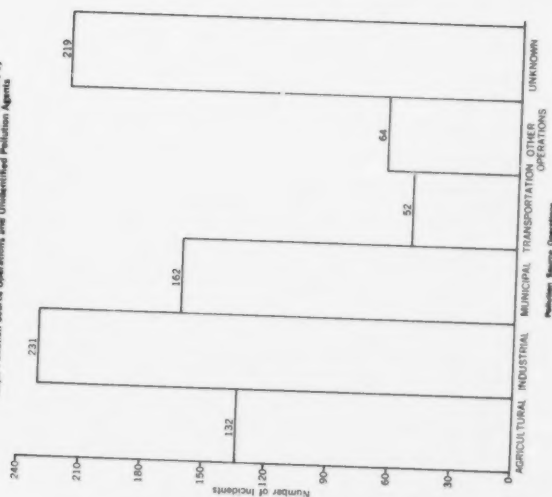
FIGURE 4—Number of Fish Kill Reports by Source of Pollution
(Total: 860)



SEWERAGE SYSTEMS UNDER MUNICIPAL OPERATIONS . . .

. . . led all other individual sources of pollution in the number of reported fish kill incidents. Figure 4 shows the relationship between the number of reports and the individual sources of pollution. Note that the number of reports varies from one for "barge or boat" to 133 for "sewerage systems." Unknown operations are not included.

FIGURE 5—Reported Number of Incidents of Pollution-Caused Fish Kills by Major Pollution Source Operations and Unidentified Pollution Agents



OF THE FIVE MAJOR SOURCES OF POLLUTION, INDUSTRIAL OPERATIONS LED IN NUMBER OF REPORTED INCIDENTS IN 1971 . . .

. . . with Municipal Operations in second place. Figure 5 shows the relationship between the reported number of fish kill incidents for the major pollutional sources. Due to the large number of fish kill incidents by unidentified pollution sources, the unknown category has been added to this graph. Note that the height of the bars is proportional to the reported number of fish kill incidents.

Industrial Operations

In 1971, pollution from industrial operations ranked first in the number of reported incidents (231) resulting in approximately 4.9 million fish killed (Figure 5). In 1970, pollution from industrial operations also ranked first, with 213 reported incidents killing approximately 9.8 million fish. Thus, 1971 reports show an increase in reported incidents in spite of the decreased number of fish killed.

Chemical operations accounted for more than 21 percent (49 reported incidents) of the total charged to industrial pollution.

Municipal Operations

In 1971, pollution from municipal operations ranked second in the number of reported incidents (162) resulting in approximately 25.0 million fish killed (Figure 5). This major pollution source was the largest single fish killer in 1971. In 1970, pollution from municipal operations ranked third with 119 reported incidents killing approximately 6.7 million fish, indicating a significant increase in reports and number of fish killed by this pollution source in 1971.

Sewerage systems was the cause of pollution in 133 reports, accounting for 82.1 percent of the total number of incidents resulting from municipal operations. The majority of these reports indicated low dissolved oxygen as the immediate cause of death.

Agricultural Operations

In 1971, pollution from agricultural operations ranked third in the number of reported incidents (132) resulting in approximately 1.1 million fish killed (Figure 5). In 1970, pollution from agricultural operations ranked fourth, with 107 reported incidents killing approximately 1.9 million fish.

Pesticides (75 reports) was the second leading individual source of pollution. Reports of fish kills under pesticides include incidents in which spraying machinery and pesticide containers were cleaned or dumped into nearby streams, lakes, or estuaries. However, the majority of reported incidents resulted from pesticides being washed into water by rainfall after spraying for agricultural purposes.

Manure-silage drainage (46 reports) also constituted a significant cause, with animal feedlot runoff the major contributor.

Other Operations

In 1971, pollution from "other operations", ranked fourth in the number of reported incidents (64) resulting in approximately 7.3 million fish killed (Figure 5). In 1970, pollution from other operations ranked second, with 167 reported incidents killing approximately 3.9 million fish. The significant decrease in the number of reported incidents resulted from the inclusion in 1970 of "unknown operations" in "other operations."

Other operations include highway and building construction, airport and service

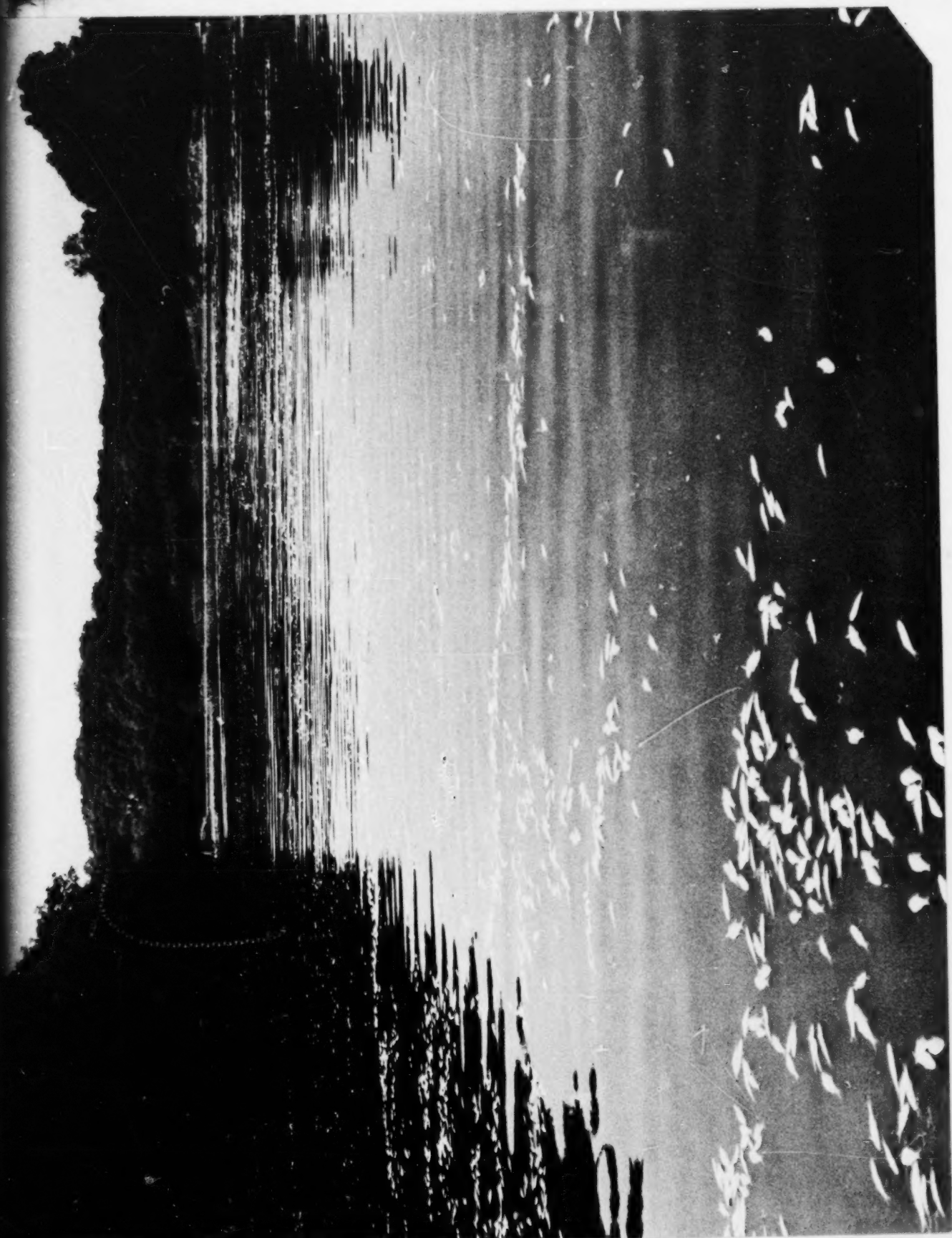
station operations, mosquito control and others not specifically designated in this report.

Transportation Operations

In 1971, pollution from transportation operations ranked fifth (and last) in the number of reported incidents (52) resulting in approximately 0.7 million fish killed (Figure 5). In 1970, pollution from transportation operations also ranked fifth with 28 reported incidents killing approximately 0.5 million fish. Fish kills caused by transportation operations occur, for example, when a pipeline springs a leak sending oil flowing into streams, or when a truck or railroad tank car overturns, spilling a lethal cargo into a waterway.

Unknown Operations

In 1971, unknown operations, a new classification, was added as a major source of pollution. "Unknown" is used when a fish kill cannot be linked to a specific pollutant or pollution source, but an investigator is reasonably confident that the fish did not die from natural causes. In many cases an investigator is not notified that a fish kill occurred until it is too late to identify a specific pollution agent due to the deterioration of fish. In 1971, unknown operations were responsible for 219 reported incidents resulting in approximately 35.4 million fish killed (Figure 5). The source of pollution was unidentifiable for approximately 25 percent of all reported incidents in 1971.



Analyses of Pollution— Causing Operations— Environmental Protection Agency Regional Basis

A summary of the reported number of pollution-caused fish kill incidents and pollution source operations within each Environmental Protection Agency Region is given in Table 9. This table permits a comparison of the frequency of reported incidents in different sections of the U.S. due to different pollution sources. Figures 6 through 15 are bar charts for each Environmental Protection Agency Region. These charts indicate the percent of reported incidents within a given region for individual sources of pollution, and also list the states within each respective region. Figures in the charts are derived from Table 9.

Agricultural Operations

Manure-silage drainage in Region V (21 reports) was the most frequently reported individual source of pollution under agricultural operations for any of the ten regions. However, pesticides were responsible for 16 reported incidents in Region VI, and 15 reported incidents in both Regions IV and IX, making it the leading agricultural source of reported pollution-caused fish kill incidents for all regions combined. Fertilizers were reported as the pollution source in 11 fish kill incidents from Regions III, V, and VII but represent only 8.3 percent of the agricultural operations total.

Industrial Operations

Chemicals in Region III (14 reports) was the most frequently reported individual

source of pollution under industrial operations for any given region, and also for all regions combined (49 reports). "Other", also under industrial operations, was not included in this analysis since it comprises several individual sources of pollution.

Municipal Operations

Sewerage systems in all regions was the most frequently reported individual source of pollution (Region X excepted) under municipal operations, totaling 133 reported fish kill incidents. Regions IV, V, and VI accounted for 92 reported incidents, or 57 percent of all pollution-caused fish kill incidents resulting from municipal operations.

Transportation Operations

Transportation operations (52 reports for all regions) had the smallest number of reported fish kill incidents of any major pollution source operation. No individual source of pollution under transportation operations exceeded 7 percent of the regional total.

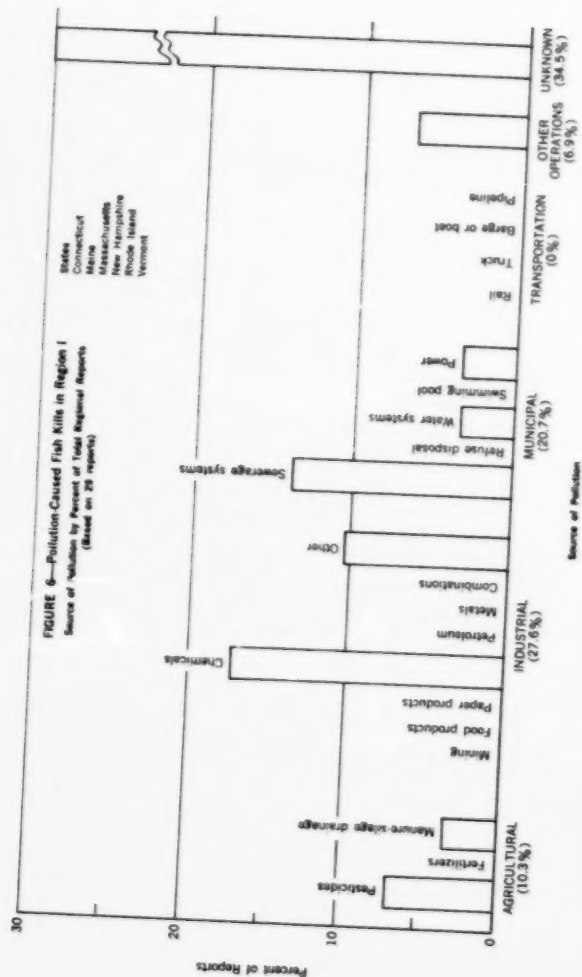
Other Operations

Other operations are a general category for those identifiable sources of pollution which do not fall into the other four major sources. In 1971, Region III accounted for 25 percent of the reported incidents caused by pollution from other operations.

TABLE 9—Number of Fish Kill Reports by Source of Pollution Within EPA Regions, 1971

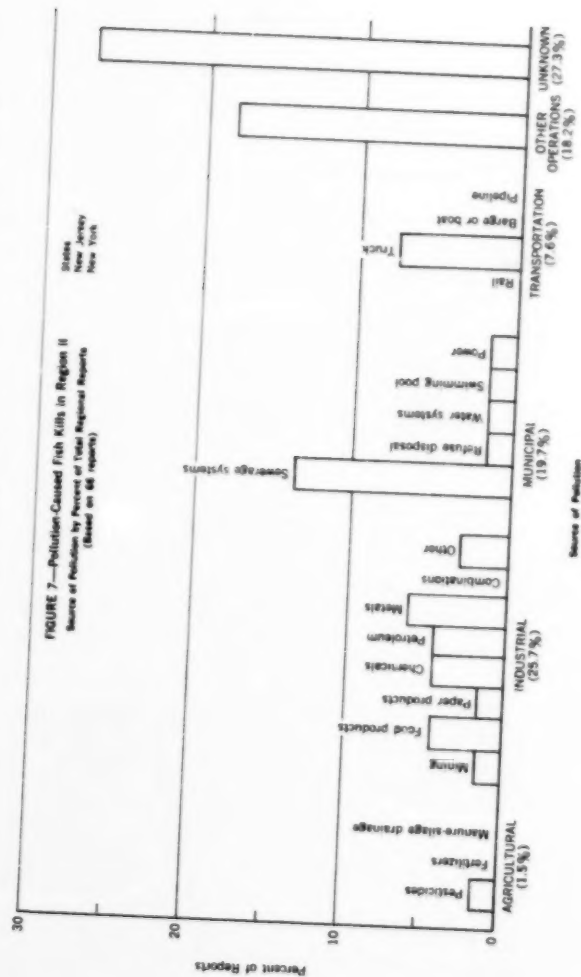
Source of pollution:	EPA Regions										Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	
Agricultural:											
Pesticides	2	1	4	15	9	16	6	2	15	5	75
Fertilizers			1		6		4				11
Manure-silage drainage	1		7	5	21	3	5	3	1		46
Subtotal	3	1	12	20	36	19	15	5	16	5	132
Industrial:											
Mining		1	10	7	7		3	1	1		30
Food products		3	1	2	13	3	2			1	25
Paper products		1		3	4	1	1				10
Chemicals	5	3	14	6	4	11	3		2	1	49
Petroleum		3	9	3	4	4	5		1	1	30
Metals		4	6	6	3	2		2			23
Combinations		1	2	1	5						9
Other	3	2	7	5	24	6	2		1	5	55
Subtotal	8	17	48	34	60	32	16	3	5	8	231
Municipal:											
Sewerage systems	4	9	13	29	31	32	8	3	3	1	133
Refuse disposal		1			4						5
Water systems	1	1	3	4	2				1		12
Swimming pool		1	1								3
Power	1	1	2		3				2		9
Subtotal	6	13	19	33	40	32	8	3	4	4	162
Transportation:											
Rail			1	2	1	2	5		1	1	13
Truck		5	8	3	4	2	1	2	5		30
Barge or boat						1					1
Pipeline			2	1	3	2					8
Subtotal		5	11	6	8	7	6	2	6	1	52
Other Operations:	2	12	16	4	5	12	3		4	6	64
Unknown:	10	18	12	51	47	30	14	2	18	17	219
Total:	29	66	118	148	196	132	62	15	53	41	860

Table 9 compares the number of reported pollution-caused fish kill incidents by individual source of pollution within, and between, each EPA region. Region VIII reported the smallest number of fish kill incidents (15 reports) while Region V (196 reports) led in the number of reported incidents.



IN 1971, "CHEMICALS" LED IN REGION I...

... among individual sources of pollution (Figure 6) with 17.2 percent of the total number of reported fish kill incidents in this region, while "sewerage systems" was second with 13.8 percent of the reported total. These percentages are based on 29 fish kill reports in Region I.

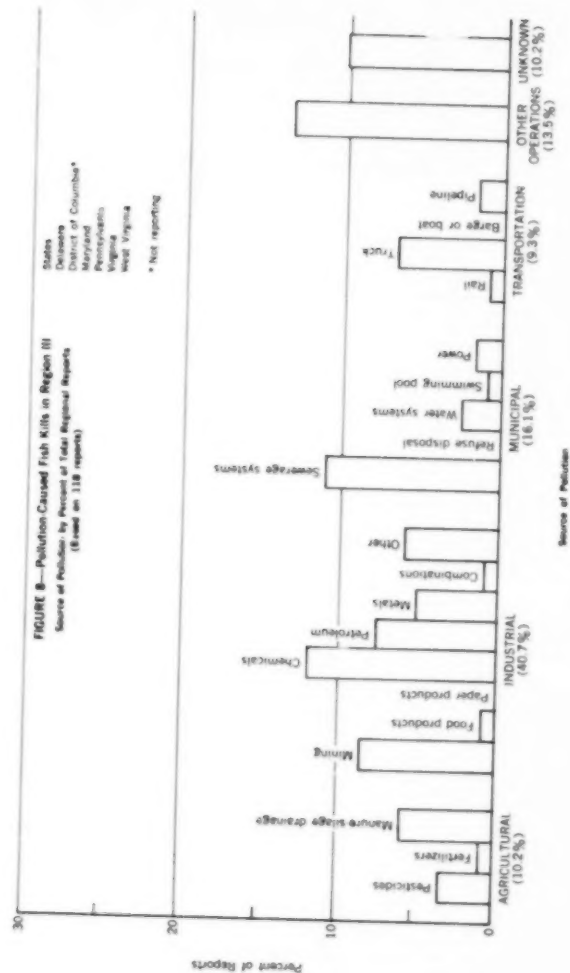


IN 1971, "SEWERAGE SYSTEMS" LED IN REGION II...

... among individual sources of pollution (Figure 7) with 13.6 percent of the total number of reported fish kill incidents in this region, while pollutants spilled due to "truck" operations were second with 7.6 percent of the reported total. These percentages are based on 66 fish kill reports in Region II.

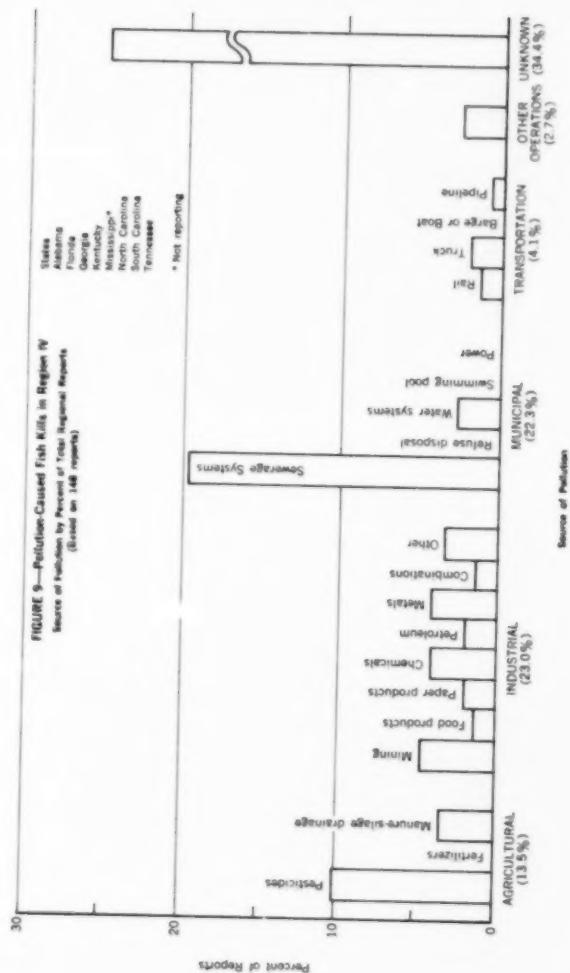
IN 1971, "CHEMICALS" LED IN REGION III . . .

. . . among individual sources of pollution (Figure 8) with 11.9 percent of the total number of reported fish kill incidents in this region, while "sewerage systems" was second with 11.0 percent of the reported total. These percentages are based on 118 fish kill reports in Region III.



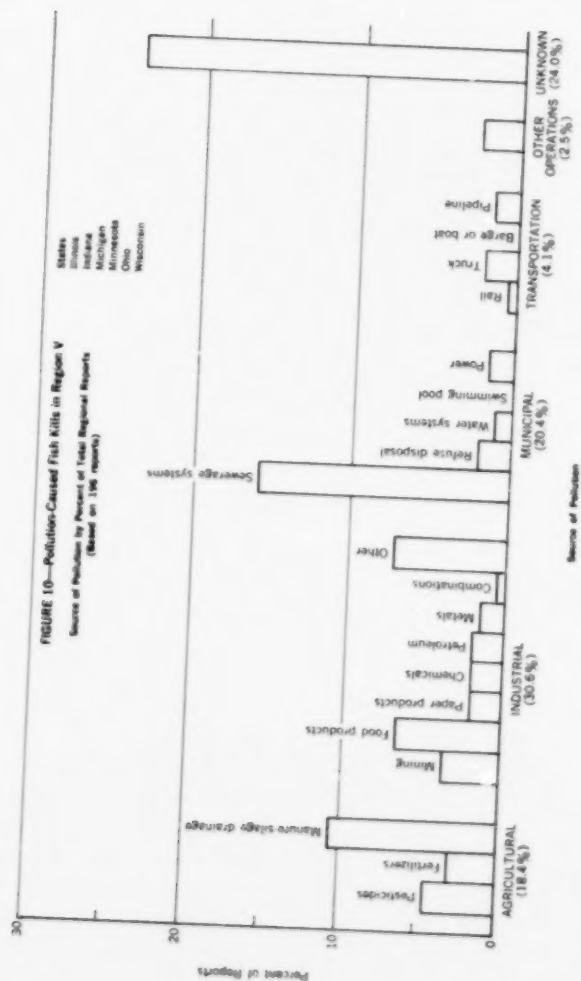
IN 1971, "SEWERAGE SYSTEMS" LED IN REGION IV . . .

. . . among individual sources of pollution (Figure 9) with 19.6 percent of the total number of reported fish kill incidents in this region, while "pesticides" was second with 10.1 percent of the reported total. These percentages are based on 148 reports in Region IV.



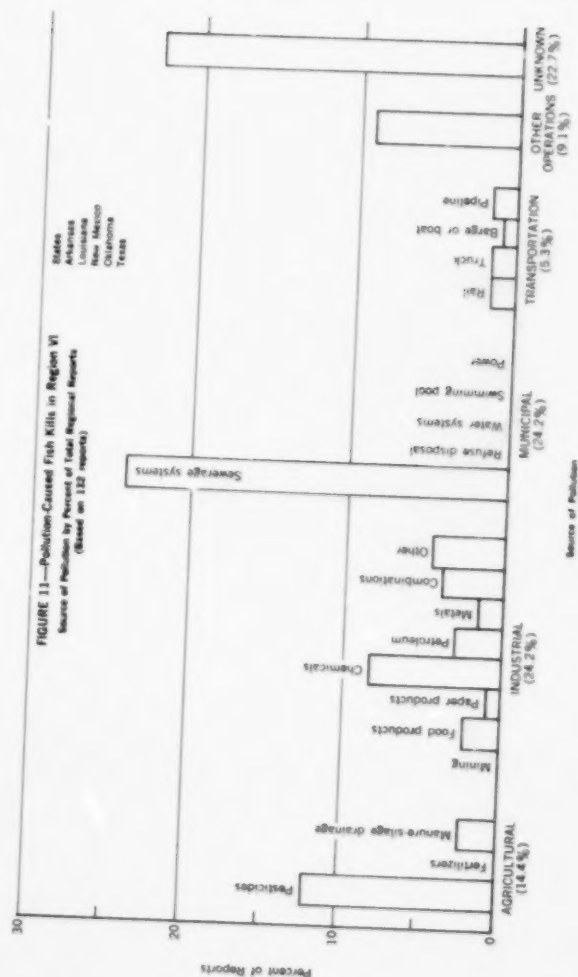
IN 1971, "SEWERAGE SYSTEMS" LED IN REGION V ...

... among individual sources of pollution (Figure 10) with 15.8 percent of the total number of reported fish kill incidents in this region, while "manure-silage drainage" was second with 10.7 percent of the reported total. These percentages are based on 196 reports in Region V.



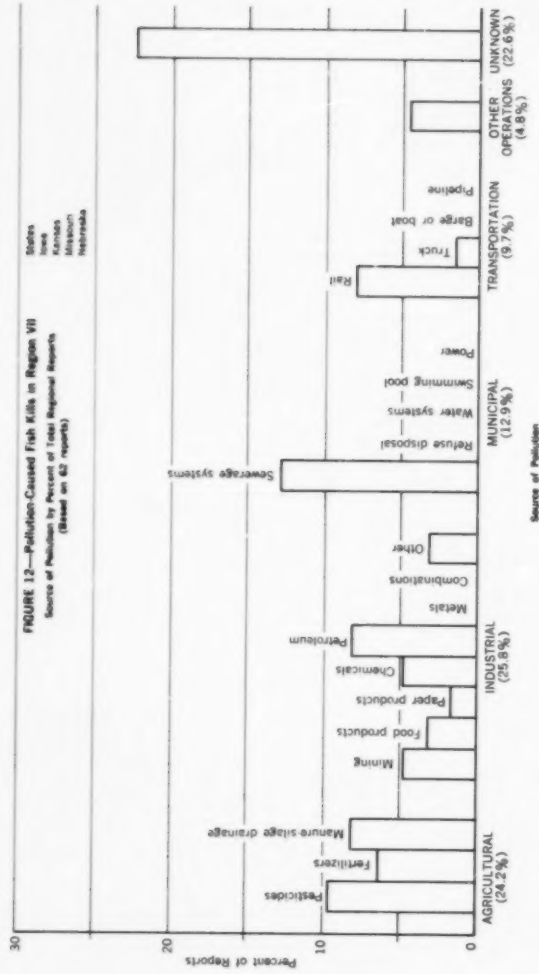
IN 1971, "SEWERAGE SYSTEMS" LED IN REGION VI ...

... among individual sources of pollution (Figure 11) with 24.2 percent of the total number of reported fish kill incidents in this region, while "pesticides" was second with 12.1 percent of the reported total. These percentages are based on 132 reports in Region VI.



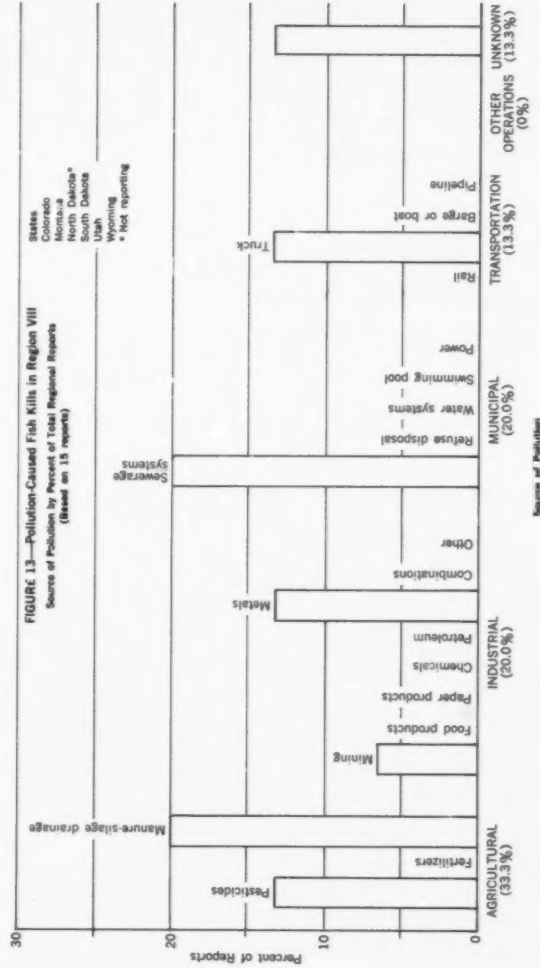
IN 1971, "SEWERAGE SYSTEMS" LED IN REGION VII . . .

. . . among individual sources of pollution (Figure 12) with 12.9 percent of the total number of reported fish kill incidents in this region, while "pesticides" was second with 9.7 percent of the reported total. These percentages are based on 62 reports in Region VII.



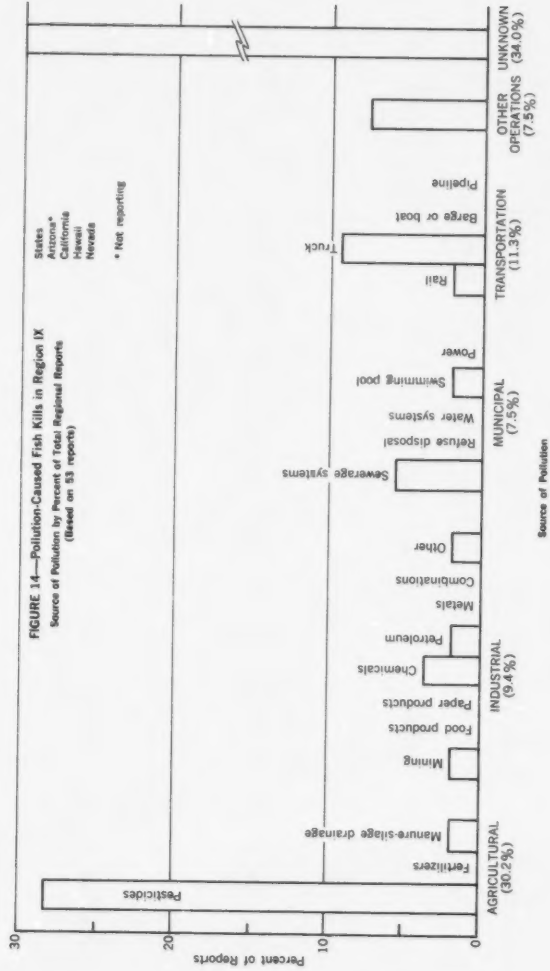
IN 1971, "SEWERAGE SYSTEMS" AND "MANURE-SILAGE DRAINAGE" TIED FOR THE LEAD IN REGION VIII . . .

. . . among individual sources of pollution (Figure 13) with 20.0 percent each of the total number of reported fish kill incidents in this region. These percentages are based on 15 reports in Region VIII.



IN 1971, "PESTICIDES" LED IN REGION IX...

... among individual sources of pollution (Figure 14) with 28.3 percent of the total number of reported fish kill incidents in this region, while "truck" was second with 9.4 percent of the reported total. These percentages are based on 53 reports in Region IX.



IN 1971, "PESTICIDES" LED IN REGION X...

... among individual sources of pollution (Figure 15) with 12.2 percent of the total number of reported fish kill incidents in this region, while "power" was second with 4.9 percent of the reported total. These percentages are based on 41 reports in Region X.

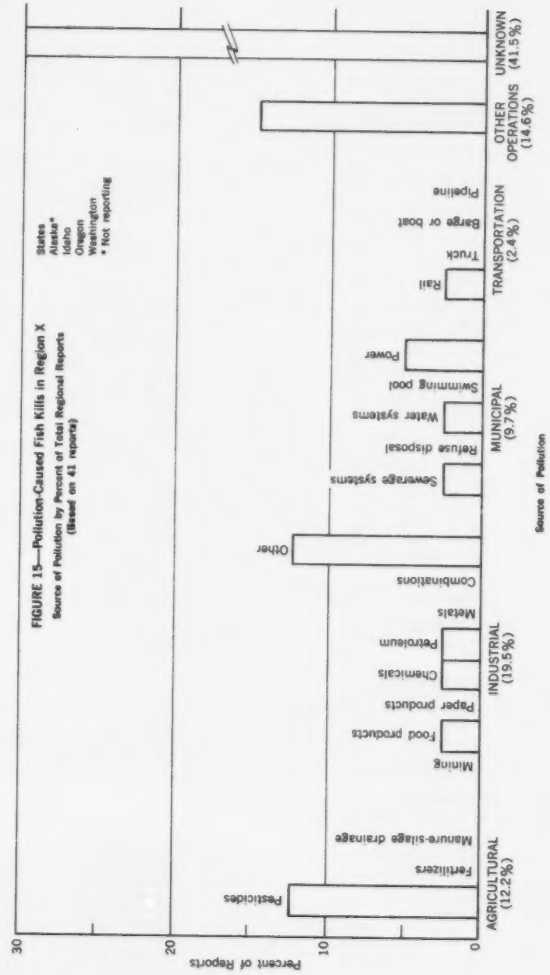


Table 10 lists individual fish kills with identified causes by State. Tabular heading information for each fish kill includes body of water, city or town,

date of kill, cause, type of fish killed (game or nongame), percent of commercial value, estimated fish killed, severity, extent of damage, and duration.

TABLE 10—Report of Fish Kills, 1971—Cause Identified

Body of water	City or town	Date	Cause see code page 32	Type of fish killed			Estimated fish killed	Severity see code page 32	Esti- mated miles or acres affected	Duration Days Hrs.
				Percent game	Percent non- game	Percent kill with com- mercial value				
ALABAMA										
Locust Fork	Birmingham	7 17 71	27							
Waxahatchee Cr.	Columbiana	5 10 71	26	10	90	10	1,000,000	2	32M	2
Clark Spring Br.	Decatur	10 18 71	31	52	48		2,571	1	14M	
Wheeler Reservoir	Decatur	12 02 71	24	42	58	9	920	2	2M	2
Wheeler Reservoir	Decatur	12 11 71	24	1	99		179	4		
Locust Fork	Flat Top	12 28 71	24	60	40		11,550	3		
Valley Creek	Gilmore	6 16 71	27	32	68	64	4,990	3		
Eslava Cr-Dog R.	Mobile	9 24 71	31	1	99	1	196	2	2M	
Garrows Bend Bay	Mobile	7 15 71	31		100	100	2,500,000	2	1M	1
Garrows Bend Ch.	Mobile	6 29 71	23		100	100	2,030,035	2	1M	18
Industrial Canal	Mobile	8 25 71	23	1	99	99	1,500	3		
Industrial Canal	Mobile	5 11 71	31	1	99	62	30,498	2		
Polecat Bay	Mobile	8 01 71	31		100	100	2,920	3	2M	2
Polecat Bay-Ca	Mobile	1 07 71	21		100	1	403,780	2	2M	1
Beaverdam Creek	Mooreville	1 07 71	26		100		5,006	4	5A	
Beech Creek	Selma	8 24 71	11	84	16		200	3	5M	
Beech Creek	Selma	9 22 71	26		100		778	4	2M	2
Six-Mile Creek	Somerville	8 30 71	26	30	70	12	350	4	1M	2
Lake Tuscaloosa	Tuscaloosa	6 18 71	13	15	85		1,418	2	5M	2
		8 22 71	11	70	30	25	9,123		20A	2 12
ARKANSAS										
Big Creek	Bloomer	7 01 71	28	50	50		12,000	1	2M	4
Spadra Creek	Clarksville	5 05 71	13	30	70	15	3,500	1	4M	2
Salado Creek	Floral	6 09 71	44	60	40	20	2,864	2	5M	4
Lake Hamilton	Hot Springs	2 22 71	26	20	80		14,940	1	3A	3
Little Buffalo R.	Jasper	6 16 71	31	15	85		250	3	1M	1
Johnson Trout Fm.	Johnson	11 06 71	42	100		100	75,000	1		1
Mud Creek	Johnson	5 18 71	11	20	80		2,000	1	2M	1
Bayu Two Prairie	Lonoke	8 03 71	11	3	97			1	12M	
Lee Brnch-Spadra	Washington Co	8 06 71	13	10	90		950	1	1M	1
CALIFORNIA										
Pine & Mill Cr.	Bishop	8 24 71	21	100			1,000	1	1M	
Palo Verde Irrig.	Blythe	2 16 71	11	2	98			3		
Churn Cr.	Central Valley	7 02 71	24	50	50		500	2	1M	
Churn Creek	Central Valley	7 02 71	24	50	50		500	2	1M	
Little Chico Cr.	Chico	5 12 71	34	10	90		800	2	1M	24
Dist 999 Canal	Clarksburg	5 13 71	11	1	99		2,035	3	3M	
Icaria Creek	Cloverdale	5 03 71	42	100			300	2	1M	1
Sacramento R.	Dunsmuir	7 22 71	41	100			500	3	6M	
Sacramento River	Dunsmuir	7 22 71	25	100			500	2	1M	
Rattlesnake Cr.	Forest Glen	9 24 71	42	50	50		2,000	3	6M	
Canal-Sheldon Av.	Gridley	6 29 71	11	25	75		575	2	3M	1
Farm Pond	Hamilton City	3 13 71	11	100			5,100	1	2A	24
San Mateo Creek	Hillsborough	8 12 71	31	100			300	3	1M	1
Pear Canal	Holtville	4 01 71	11	2	98			3	1M	
Moss Landing Lag.	Moss Landing	8 12 71	50		100		300	3	5A	1
Bel Marin Keyes	Novato	5 20 71	50	100			500	3	25A	1
Redwood Shores	Redwood City	9 20 71	28	1	99	5	11,000	2	5A	1
Butte Creek	Richvale	9 07 71	11	25	75		1,325	3	12M	24
S F Bay	San Francisco	4 08 71	31	20	80		600	3	25A	1
Guadalupe River	San Jose	3 22 71	42	10	90		50	4	1M	3
Tidewater Creek	San Rafael	10 15 71	31	10	90		50	4	1M	
Unnamed Creek	Santa Rosa	4 14 71	13		100		50	4	3M	4
Martis Cr.	Truckee	11 06 71	50	33	67		1,015	1		
Horse Creek	Vacaville	8 12 71	11	10	90		275	3	1M	
Corralitos Cr.	Watsonville	5 11 71	11	94	6		800	4	3M	1
Boles Creek	Weed	11 03 71	42	100			30	4	1M	
Boles Creek	Weed	8 15 71	42	95	5		525	3	2M	2
Ca S Mallard R.	West	7 20 71	11	1	99		275	2	3M	24
Adams Ditch	Sacramento	8 24 71	11	66	34		3,000	2	5M	
Knight Cut	Winters	5 31 71	11	25	75		575	4		
COLORADO										
Rio Grade River	Creede	9 01 71	31	100			1,000	4	15M	4
Rio Grade River	Creede	8 31 71	26	100			600			2
CONNECTICUT										
Broad Brook Strm	Ellington	9 05 71	13	20	80		10,000	1	4M	
East Aspetuck R.	New Milford	8 09 71	50	34	66		300	2	2M	3
Thames River	Norwich	9 06 71	31		100	100	1,000,000	1	1M	
Trout Brook	Plainville	8 19 71	28	10	90		200	2	1M	
Middle River	Stafford Sprngs	9 11 71	28	100				1	1M	
Millstone Point	Waterford	8 — 71	35	100	100		2,000,000			99
DELAWARE										
St Jones River	Dover	7 02 71	31	90	10		1,250	2	1M	2
FLORIDA										
Lake Glenada	Avon Park	3 11 71	31	1	99		4,010	4		
Lake Glenada	Avon Park	2 17 71	31	1	99		2,078	4		
Rim Ca-Okeechobee	Bell Glade	9 03 71	13	20	80	30	2,000	2	320A	1
Lake Menzie	Dundee	7 23 71	28	99	1		7,380	2	50M	3
Peace River	Fort Meade	12 03 71	21					2	15A	1
Williamson Creek	Jacksonville	9 11 71	31	12	88	87	1,167	3	15A	3
Williamson Creek	Jacksonville	9 — 71	31	1	99	99	11,738	3	15A	2
Banana Lake	Lakeland	3 29 71	31	4	96		273,100	2	342A	3
Canal	Margate	7 07 71	33	90	10		100	3	1A	

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause, see code page 32	Type of fish killed		Estimated fish kill with commercial value	Estimated fish killed	Severity, see code page 32	Esti- mated acres or mites affected	Days Duration
				Percent game	Percent non-game					
Pemberton Creek	Plant City	2-71		31	41	15	4,700		9M	28
Arbuckle Creek	Sebring	4-71		28	91	5	118		6M	1
Dinner Lake	Sebring	4-71		28	91	5	118		6M	1
La Thonotosassa	La Thonotosassa	4-71		31	28	6	3,700		8A	28
Lake Conroe	Winter Haven	9-71		22	50	50	720		1M	3
N Ashburn Pond	Ashburn	10-71		11	50	50	5,000		2A	2
Spirit Creek	Caro	8-71		31	20	90	4,400		2A	4
Nonday Creek	Carterville	6-71		31	50	50	2,000		2M	2
Pettit Creek	Carterville	8-71		11	100	90	350		3M	1
Friday Rd-fordham	Cochran	8-71		11	15	85	750		14M	1
Cordele Hatchery	Cordele	8-71		11	100	85	200		2A	1
Piedmont Experiment	Davisboro	6-71		11	100	85	550		2A	1
Coosawattee Riv	Ellijay	6-71		11	100	85	300		2A	1
Balus Creek	Gainesville	8-71		11	100	85	1,000		7A	1
Alton Dykes Pond	Hawkinsville	6-71		11	100	85	38,000		8M	1
Priv Rd W Hanson	Rentz	6-71		11	100	85	600		5A	21
Private Pond	Swainsboro	6-71		11	100	85	1,850		12A	3
Ocmulgee River	Warner Robins	8-71		31	60	40	500		8M	3
Kapakahiti Canal	Honolulu	3-09-71		11	13	87	1,210		1M	1
Moanalua Stream	Honolulu	3-05-71		11	6	94	6,000		1M	1
Waimanalo Stream	Waimanalo	6-25-71		50	100	2	225		1M	2
American Falls R	Aberdeen	2-71		22	100	98	612		10A	2
Boise River	Boise	11-19-71		31	100	80	5,000		2M	2
Logger Creek	Boise	7-28-71		31	100	80	400		1M	2
Snake-Salmon Riv	Butte County	7-71		11	100	80	11,000		2M	2
Portneut River	Lava Hot Spring	7-71		11	60	40	1,000		7M	2
Lamberts Pond	McCall	6-20-71		28	100	100	1,000		1A	2
Gar Creek	Kankakee	6-15-71		24	11	99	10,793		2M	18
Soldiers Creek	Kankakee	9-16-71		24	11	99	10,793		2M	18
W Br Salt Fork	Leverett	5-03-71		22	1	6	4,842		1M	2
2 & Vermillion Cr	Mendota	9-09-71		22	1	6	26,060		4M	2
Casey Fork Creek	Mt Vernon	7-08-71		28	3	97	5,913		4M	2
Brs Vermillion R	Paxton	4-16-71		12	42	37	98,945		10M	10
Rock River	Rock Falls	7-31-71		27	42	21	98,945		10M	10
W Fk-White River	Anderson	9-03-71		31	20	100	470		2M	10
Moats Creek	Brookston	8-24-71		13	80	100	1,200		2M	10
Spring Creek	Brookston	5-03-71		13	80	100	1,200		2M	10
White Creek	Brookston	10-12-71		13	80	100	1,200		2M	10
Symonds Creek	Cambridge City	7-15-71		42	35	65	214		6M	1
Doe Creek	Cloverdale	9-06-71		13	40	60	380		1M	1
Campbell Ditch	Elizaville	6-29-71		11	40	60	150		2M	1
Jack's Ditch	Elizaville	8-21-71		11	40	60	150		2M	1
Deer Creek	Elizaville	9-02-71		11	40	60	150		2M	1
Harber Ditch	Elizaville	11-18-71		11	40	60	150		2M	1
Mud Pine Creek	Elizaville	10-18-71		11	40	60	150		2M	1
Mill Creek	Headlee	5-06-71		11	40	60	150		2M	1
Perry Creek	Kingman	7-13-71		11	40	60	150		2M	1
Kokomo Creek	Kokomo	6-28-71		11	40	60	150		2M	1
Grassy Br-El R	New Brunswick	6-28-71		11	40	60	150		2M	1
Lilly & Pipe Crs	Orestes	10-02-71		11	40	60	150		2M	1
Storm Creek	Seymour	12-17-71		11	40	60	150		2M	1
Ball Creek	Sulphur Springs	6-24-71		12	44	90	1,038		15M	1
Tippecanoe River	Warsaw	9-30-71		13	50	95	2,000		47M	1
Richland Creek	Whitehall	6-24-71		13	50	95	350		47M	1
Big Sioux River	Beloit	9-17-71		28	5	95	15,000		15M	1
Stewart Creek	Charles City	4-22-71		42	5	95	15,000		15M	1
Deep Creek	Charles City	7-23-71		42	5	95	15,000		15M	1
Maus Park Pond	Dubuque	5-21-71		23	15	85	35,000		35M	1
Spring Creek	La Porte City	8-18-71		22	2	98	10,000		10M	1
W Br Walnut Riv	El Dorado	6-15-71		41	25	70	2,500		2M	1
Cow Creek	Hutchinson	1-25-71		50	40	60	1,000		2M	1
Rock Creek	Independence	5-30-71		41	60	40	2,000		2M	1
Lib-Arkansas R	Maize	4-10-71		31	5	95	175		1M	1
Elm Creek	Miller-Lyon Co	7-06-71		13	35	65	2,500		2M	1
Gillion Creek	Potwin	4-30-71		13	35	65	4,300		2M	1
Lib-Arkansas R	Wichita	8-30-71		50	100	10	300		7A	5
Gunpowder Creek	Florence	4-16-71		25	60	40	1,953		6M	12
S Fk Salt River	Harrodsburg	8-17-71		31	60	40	3,479		12	20

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause - see code page 32	Type of fish killed		Percent kill with commercial value	Estimated fish killed	Severity: see code page 32	Estimated miles or acres affected	Duration	
				Percent game	Percent non-game					Days	Hrs.
So Fork Little R.	Hopkinsville	5 27 71	26	20	80						
Beargrass Creek	Jefferson Co	9 29 71	25		100		1,000	1	4M	4	
Jessamine Cr.	Jefferson Co	8 24 71	26					4	1M	1	4
Silver Creek	Madison Co	11 17 71	31				30,598	1	2M	2	7
Triplett Creek	Morehead	8 30 71	31				100	4	3M	3	6
Hinkston Creek	Mt Sterling	8 08 71	21					4	11M	1	
Tradewater River	Providence	8 06 71	25					4			
Sexton Creek	Sexton	7 02 71	21	20	80		10,000	1	10M	2	
Sexton Creek	Sexton	6 09 71	21	5	95			4	1M	1	
Long Lick	Shepherdsville	10 12 71	50				1,468	2	1M	3	10
St Asaph Creek	Stanford	4 22 71	11				6,506	2	1M	1	5
Beech Creek	Waddy	9 11 71	13					4	2M	2	17
Tules Creek	Westview	7 28 71	13				6,465	1	3M	7	11
LOUISIANA											
Bayou Roberts	Alexandria	9 02 71	11	30	70	40		4	1M	1	
Irish Canal	Alexandria	4 23 71	41	25	75	5	500	2	1M	1	
Red River	Alexandria	7 29 71	31	1	99	1		4	5M	1	
Rynella Canal	Avery Island	8 01 71	11					1	3M	2	
Btn Rge Barge Ca	Baldwin	8 11 71	11		100		1,030	2	1M	2	
Btn Rge Barge Ca	Baton Rouge	8 27 71	31	10	90	20	1,000	3	6M	1	
Btn Rge Barge Ca	Baton Rouge	7 16 71	24	20	80	10	4,000	3	2M	2	
Btn Rge Barge Ca	Baton Rouge	1 29 71	24	5	95	90	6,000	3	2M	2	
Btn Rge Barge Ca	Baton Rouge	1 08 71	28	10	90	90	5,000	3	2M	3	
Monte Sano Bayou	Baton Rouge	3 05 71	27	50	50		200	4	1M	1	
Sik Wtr Barge Ca	Baton Rouge	1 09 71	24	10	90	30	20,000	2	3M	3	
Bayou Dulac	Bunkie	3 25 71	22	5	95	90		4	2M	1	
Charenton Nav Ca	Charenton	8 13 71	11	10	90		20,000	2	8M	2	
Fausse Pointe La	Charenton	8 04 71	11	10	90		5,000	3	40A	2	
Bayou De Glaises	Cottonport	8 01 71	11	5	95	90		3	2M	1	
Houma Nav Canal	Dulac	7 19 71	22	10	90	90	5,000	3	5M	1	
Empire Canal	Empire	8 26 71	31	10	90	80	3,000	3	3M	3	12
Blind River	Gramercy	9 01 71	31	40	60	30		2	4M	1	12
ICWW & 16 St Ca	Harvey	8 05 71	27		100		2,000	3	1M	1	
Calcasieu River	Lake Charles	12 10 71	24		100		200	2	2A	1	12
Calcasieu River	Lake Charles	8 06 71	28	25	75		500	4	6M	24	
Sabine River	Logansport	9 20 71	31	30	70	10	50,000	3	10M	3	
Toledo Bend Resr	Logansport	7 03 71	27	1	99		2,500	2	2M	1	
Ouachita River	Monroe	11 12 71	28	5	95	80	100	3	6M	3	
Bayou Teche	New Iberia	12 23 71	28		100		400	2	3M	12	
Bayou Bienvenue	New Orleans	8 31 71	31	10	90	50	3,000	2	3M	3	
Bayou Michaud	New Orleans	9 02 71	11	60	40		500	3			
Calcasieu River	Oberlin	7 04 71	23	75	25	10	7,500	4	1M	1	
Bayou Bulltail	Plaquemine	5 21 71	43	50	50	25	3,500	1	3M	8	
Bayou La Butte	Plaquemine	4 21 71	24	10	90	5	5,500	1	1M	1	
40 & 28 Arpent C	Raceland	7 27 71	11	80	20	80	2,000	2	20M	5	
Cross Bayou	Shreveport	10 21 71	31	5	95	40	1,000	2	2M	1	
Cross Lake	Shreveport	12 16 71	41	100			1,000	2	4M	1	
Cross-12-Mi Bayu	Shreveport	11 29 71	31	100	90		1,000	2	6M	1	
Twelve-Mi Bayou	Shreveport	10 26 71	31	5	95	40	3,000	2	6M	2	
Salt Bayou	Siidell	9 12 71	31	20	80	70	1,000,000	2	1M	12	
Red Chute Canal	Sligo	5 16 71	11	100			400	3	9M	3	
Bayou Braud	St Gabriel	8 23 71	24	50	50	50	7,500	2	10M	5	
Bayou Lafourche	Thibodaux	7 27 71	11				1,000	3	20M	2	
Little River	Tullos	9 03 71	24	50	50	50	15,000	2	5M	12	
Lake Natchez	White Castle	8 02 71	11	50	50	25	2,000	1	160A		
Bay Ronfleu	Wisner	9 02 71	50	50	50		1,000	2			
MAINE											
Youngs Brook	Westfield	7 11 71	33	70	30		400	1	1M		
MARYLAND											
Baltimore Harbor	Baltimore	2 18 71	25	75	25		2,000			14	
Bear Creek	Baltimore	9 16 71	26	1	99	100	177,550			1	
Lt Blackwater R.	Cambridge	5 04 71	13		100		30				
Basin Run	Colora	8 24 71	13								
Basin Run	Colora	8 14 71	13								
Susquehanna Riv	Conowingo	5 09 71	35		100	100	1,253,516				
Riviera Beach Pd	Riviera Beach	5 - 71	50	14	86		3,000		10A	10	
Pawn Run	Sand Flat	8 20 71	11	34	66		100		1A		
Ross Cove	Seyerna Park	7 12 71	50	1	99		800		2M		
Piney Run	Taneytown	6 19 71	31	99	1		113,000		5M		
Little Pipe Cr	Westminster	6 21 71	31		100		3,000				
MASSACHUSETTS											
Great Pond	Falmouth	8 07 71	11		100		15,000	3	1M	12	
Green Pond	Falmouth	8 05 71	11		100		18,000	3	1M	1	
Lee River	Somerset	8 05 71	24	11	89	88	1,222,800	2	1M	1	
MICHIGAN											
5 Br Riv Raisin	Adrian	8 02 71	24					1	5M	1	
Red Cedar-Grand	East Lansing	8 10 71	31				3,300	2	1M	1	
Weadock Channel	Essexville	10 21 71	28	1	99		4,000	1	1M	2	
Frank & Poet Drn	Gibraltar	1 25 71	26		100		50,000	1	2M		
Tittabawassee R.	Midland	7 27 71	24	50	50		2,000	1			
MINNESOTA											
Red Cedar River	Austin	7 02 71	11	25	75		3,000	2	5M		
Red Cedar River	Austin	7 22 71	31	10	90		3,000	2	2M		

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause see code page 32	Type of fish killed			Estimated fish killed	Severity see code page 32	Esti- mated miles or acres affected	Days Duration Hrs.
				Percent game	Percent non- game	Percent kill with com- mercial value				
St Louis River	Cloquet	9 29 71	31							
Cannon River	Faribault	3 05 71	22		100		200	4	1M	
Sunrise River	North Branch	6 20 71	11	50	50		150	4	1M	
				20	80		10,000	2	6M	
MISSOURI										
Drainage Ditches	Advance	3 24 71	11							
Blackberry Creek	Asbury	9 02 71	21	60	40		25,000	2	10M	
N Fk Salt River	Brashear	9 26 71	31	80	20		12,000	2	2M	
Chariton River	Callao	1 08 71	41		100		152,752	2	14M	
Spring River	Carthage	9 01 71	31	43	57		71,000	2	15M	
Tobo Creek	Clinton	7 29 71	21		100		6,000	2	5M	
Gans Creek	Columbia	11 11 71	50					2	3M	
Hinkson Creek	Columbia	7 31 71	21					2	2M	
N Fk S Fabius R	Edina	5 21 71	12	5	95		12,600	1	2M	
Hess Pond	Faucett	6 30 71	11	20	80		32,181	1	3M	
Cedar Fork Creek	Gerald	6 11 71	25					4	1A	
Rock Creek	Independence	7 27 71	25	25	75		19,000	2	10M	
Opossum Creek	Jasper	10 30 71	13		100		200	4	1M	
Center Creek	Joplin	10 17 71	24	100			1,000	4	1M	
Fox River	Kahoka	8 20 71	22		100		20,300	4	4M	
Middle Fk Salt R	Macon	4 16 71	24	59	41		150	4	1M	
Plunkett Park La	Mexico	2 25 71	41	1	99		2,300	1	3M	
Davis Creek	Mound City	5 13 71	12	1	99		1,000	3	6A	
Davis Creek	Mound City	9 01 71	25		100		12,356	1	7M	
Shoal Creek	Neosho	10 17 71	31				2,750	3	1M	
Birch Branch	Nevada	8 02 71	31					4	2M	
James River	Nixa	7 11 71	31	46	54		70,000	2	1M	
South River	Palmyra	12 21 71	24	30	70		2,500	3	6M	
Drainage Ditches	Parma	3 27 71	11	50	50		40,000	2	1M	
Rock Creek	Rock Port	4 12 71	12		100		2,500	1	3M	
Fiat Creek	Sedalia	7 02 71	25	9	91		36,000	1		
Watkins Creek	St Louis	8 23 71	25		100		200	4	4M	
Cambell Pond	Success	8 02 71	11	100			100	1	1A	
Meister Branch	Troy	7 07 71	13		100		150	1	2M	
Grand Glaze Cr	Valley Park	2 11 71	31		100			2	1M	
Post Oak Creek	Warrensburg	6 15 71	28	5	95		10,000	1	3M	
MONTANA										
Prickly Pear Cr	East Helena	8 27 71	26	5	95		3,000	2	2M	
W Gallatin River	Gallatin Gateway	9 02 71	42					4	4M	
Highwood Creek	Highwood	9 03 71	13	10	90		1,000	2	1M	
Clark Fork River	Missoula	3 22 71	21	100				4		14
Sixteen mile Cr	Ringling	6 18 71	11	100				2	2M	
S Fk Crow Creek	Ronan	2 04 71	31	26	74		5,280	1	4M	1
Denny Creek	W Yellowstone	9 29 71	42	100				4	2M	
NEBRASKA										
Pibel Lake	Bartlett	6 05 71	11	100			1,000	4	2A	
Moffett Drain	Minatare	3 24 71	11	25	75		135	2	1M	
Elm Creek	Ord	7 30 71	12	1	99		9,000	1	5M	
Weeping Water Cr	Weeping Water	10 19 71	31	6	94		235	2	1M	24
NEVADA										
S Fk Humboldt R	Elko	3 15 71	11	69	31		15,000	2	10M	5
Salmon Falls Cr	Wells	3 26 71	11					3		4
NEW HAMPSHIRE										
Souhegan River	Merrimack	3 16 71	31	5	95		5,000	2	1M	6
Nashua River	Nashua	9 18 71	50	5	95			2	3M	
Kezar Lake	North Sutton	6 21 71	31	1	99		100,000	2	182A	15
NEW JERSEY										
Sunset Lake	Chatham	6 29 71	50	1	99		10,000	1	2A	3
Trib-Drakes Brk	Flanders	9 15 71	50		100		10	4	1A	
Trib-Drakes Brk	Flanders	4 08 71	50	20	80		25	4	1M	4
Co Farm Pond	Gloucester Twp	4 12 71	31	50	50		1,000	2	3A	
Bidwells Ditch	Goshen	7 07 71	50	10	90	80	2,000,000	2	4M	3
Rocky Brook	Hightstown	5 07 71	33					2	2M	1
Lake Hopatcong	Hopatcong	6 11 71	50	25	75		2,000	3	20A	10
Dry Run Creek	Mays Landing	9 03 71	50		100		1,000	3	1M	3
Taylor Lake	Millburn	10 01 71	50				400	2		
Trib-Lamington R	Oldwick	12 08 71	42	5	95		200	1	1A	2
Mobil Lab Pond	Pennington	3 03 71	25					4	1A	3
Lake Carnegie	Princeton	8 14 71	50				50	3	2A	
Mohawk Pond	Red Bank	2 20 71	42		100		200	4	5A	2
Heritage Lake	Saddle River	7 04 71	50	75	25		300	4		
Lions Head Lake	Wayne	6 07 71	50	25	75			4		
NEW MEXICO										
Gila River	Cliff	7 10 71	50	100			250	2	35A	5
NEW YORK										
Nineteen Gully	Angelica	7 26 71	22	1	99		500	4	3M	2
Number Nine Brk	Athol	7 07 71	50	40	60		300	2	1M	4
Crane Brook	Auburn	11 11 71	28				2,500	4	4M	2
Buffalo Creek	Buffalo	3 26 71	26		100		100	4	1M	2
Cayuga Creek	Buffalo	8 20 71	31		100		50	4	1M	4
Scajaquada Creek	Buffalo	6 02 71	24		100		10,000	2	1M	1
Gedney Brook	Chappaqua	5 19 71	34	2	98		50	4	1M	2
Saquoit Creek	Clayville	11 05 71	23	5	95		3,000	1	4M	1
Canadaway Creek	Fredonia	9 02 71	31		100		150	4	2M	1

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause see code page 32	Type of fish killed			Estimated fish killed	Severity see code page 32	Esti- mated miles or acres affected	Duration Days Hrs.
				Percent game	Percent non- game	Percent kill with com- mercial value				
Chattaraugus Cr.	Gowanda	8 25 71	31	17	83		600		5M	10
Salmon Creek	Hilton	10 13 71	31	30	70		7,500	2	3M	1
Plum Point Creek	Himrod	12 10 71	21		100		100	2	1M	1
Fish Creek	Holcomb	12 13 71	31		100		3,000	1	6M	1
Allegheny River	Irvine Mills	8 06 71	25	9	91		62,000	1	1M	1
Sixmile Creek	Ithaca	9 18 71	26		100		1,000	2	1M	2
Chadakoin R.	Jamestown	5 13 71	26		100		300	2	2M	1
English Brook	Lake George	7 22 71	42	75	25		200	1	1M	1
Tunungwant Creek	Limestone	8 06 71	25	20	80		45,000	1	6M	2
Little Inlet	Mayville	5 14 71	22	1	99		1,500	2	1M	1
Cayuga Creek	Niagara Falls	4 05 71	42		100		10,000	2	1M	2
Chenango River	Norwich	6 29 71	24	1	99		5,000	3	1M	3
2 Mi Cr-Alghy R.	Olean	2 08 71	24		100		200	4	1M	1
Oriskany Creek	Oriskany Falls	10 14 71	28	1	99		5,000	2	2M	1
Barge Canal	Pittsford	4 28 71	31	1	99		5,000	2	3M	1
Barge Canal	Pittsford	12 07 71	31	1	99		2,000	2	1M	1
Red Creek	Red Creek	7 22 71	31		100		75	4	7M	1
Canandaigua Otlet	Shortsville	10 10 71	31	1	99		100	3	1M	1
Fivemile Creek	Ticonderoga	6 09 71	11	30	70		1,000	1	3M	3
Hudson River	Tomkins Cove	6 07 71	35	100		100	1,000	1	1M	1
Third Brook	Walton	5 05 71	32	1	99		7,000	1	3M	1
Oatka Creek	Warsaw	8 10 71	26		100		7,500	1	1M	3
Trib 5 of Big Cr.	Waterville	7 23 71	42		100		10	2	1M	1
Ellicott Creek	Williamsville	9 14 71	31		100		20,000	2	6M	1
NORTH CAROLINA										
Middle Fk-New R.	Blowing Rock	5 10 71	33	5	95		1,359	3	5M	6
Bear Swamp	Bowdens	7 07 71	11	25	75		572	2	1M	1
Cold Water Creek	Concord	7 16 71	44		100		600	2		
Indian Swamp	Fairmont	6 14 71	11	50	50		400	1	1M	3
Little River	Goldsboro	6 17 71	31	74	26		500	3	1M	1
Green Mill Run	Greenville	1 05 71	31						1M	1
Bald Mt Creek	Lewisburg	7 07 71	42	100			200	2	15M	4
Neuse River	Raleigh	7 25 71	28	68	32	28	15,000	2	700A	8
Tar River	Rocky Mount	8 15 71	33	65	35		36,832	2	5M	5
Tuckasegee River	Rocky Mount	9 09 71	33	60	40		1,024	3	5M	2
Pigeon River	Sylva	9 09 71	42	5	95		5,000	2	20M	3
Fourth Creek	Waynesville	5 31 71	23	1	99					
	Woodleaf	6 01 71	31							
OHIO										
E Fk Eagle Cr.	Adams Co	11 08 71	28				141			
E Fk Eagle Cr.	Adams Co	10 16 71	28				687			
Lt Threemile Cr.	Adams Co	2 06 71	35				1,006			
Lt Threemile Cr.	Adams Co	2 01 71	35				7,540			
Lt Riley Cr.	Allen Co	6 23 71	28				1,518			
Jerome Fork	Ashland Co	12 07 71	42				6,396			
Trib Vermilion R.	Ashland Co	12 14 71	44							
Hocking R.	Athens Co	7 28 71	21							
Unnamed Pond	Athens Co	10 31 71	28				75			
Great Miami R.	Butler Co	4 27 71	28				124			
Huff Run	Carroll Co	9 15 71	25				25,218			
Lt Darby Cr.	Champaign Co	8 24 71	31				412			
Beaver Cr.	Clark Co	6 08 71	28				41			
E Fk Honey Cr.	Clark Co	7 15 71	28				308			
Hunter Cr.	Clermont Co	5 23 71	21				77			
Leslie Run	Columbiana Co	7 17 71	21				208			
Longs Run	Columbiana Co	6 08 71	50				3,423			
W Fk Lt Beaver C.	Columbiana Co	8 16 71	32				73,527			
Tusc & Musk R.	Coshocton Co	9 12 71	23				679			
Sandusky R.	Crawford Co	8 08 71	31				573			
Chagrin R.	Cuyahoga Co	9 02 71	23				28			
Ludlow Cr.	Darke Co	9 08 71	31							
Tiffin R.	Defiance Co	9 11 71	22							
Big Walnut Cr.	Delaware Co	4 26 71	31							
Pipe Cr.	Erie Co	6 01 71	22							
Vermilion R.	Erie Co	1 20 71	31				756			
Paw Paw Cr.	Fairfield Co	8 13 71	23				1,000			
Sycamore Cr.	Fairfield Co	9 08 71	13				100			
Big Walnut Cr.	Franklin Co	10 20 71	31				118			
Blacklick Cr.	Franklin Co	10 05 71	31				148			
Scioto R.	Franklin Co	9 16 71	28				157			
Brush Cr.	Fulton & Wms Co	9 29 71	31				32			
Barren Cr.	Gallia Co	9 11 71	13							
Chicamuga Cr.	Gallia Co	9 30 71	31				133			
N Br Caesars Cr.	Greene Co	9 07 71	13				20			
Shawnee Cr.	Greene Co	6 10 71	28				1,549			
Bank Lick Cr.	Hamilton Co	12 11 71	32							
Blanchard R.	Hancock Co	11 16 71	28				1,117			
Rt 235 Stream	Hardin Co	5 05 71	44				54			
Taylor Cr.	Henry Co	5 13 71	13				3,324			
Tr S Fk Turkey F	Hocking Co	5 12 71	25							
Trib Five Mi Cr.	Holmes Co	6 24 71	28							
Indian Trail Run	Holmes Co	4 13 71	22				56			
Indian Trail Run	Huron Co	5 22 71	22							
Vermilion R.	Lake Co	9 10 71	13							
Grand R.	Lake Co	1 29 71	21							
Lake Erie	Lake Co	2 12 71	35				325			
N Fk Licking R.	Licking Co	5 27 71	33				414			
N Fk Licking R.	Licking Co	9 26 71	22				22			
							17,293			

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause - see code page 32	Type of fish killed			Estimated fish killed	Severity - see code page 32	Estimated miles or acres affected	Days Duration Hrs.
				Percent game	Percent non-game	Percent kill with commercial value				
Mad River	Logan Co	4 23 71	28				3,003			
Black R	Lorain Co	9 18 71	28				105			
Willow Cr	Lorain Co	7 15 71	32							
Maumee R	Lucas Co	10 08 71	31				131,245			
Swan Cr	Lucas Co	9 02 71	31				2,015			
Lt Sandusky R	Marion Co	10 26 71	11				661			
Great Miami R	Miami Co	9 01 71	22				54			
Great Miami R	Miami Co	10 24 71	31				22,889			
Great Miami R	Montgomery Co	9 23 71	23							
Great Miami R	Montgomery Co	9 10 71	31				548,076			
Great Miami R	Montgomery Co	1 15 71	33				7,045			
Great Miami R	Montgomery Co	4 04 71	25				1,295			
Allen Run	Morgan Co	3 25 71	28							
Chaps Run	Muskingum Co	7 23 71	21				15,741			
Thompson Run	Muskingum Co	9 28 71	21				32,678			
E Fk Duck Cr	Noble Co	8 23 71	21				224			
W Fk Duck Cr	Noble Co	10 16 71	31				51			
Flat Rock Cr	Paulding Co	9 02 71	31							
Flat Rock Cr	Paulding Co	11 17 71	31				4,761			
Flat Rock Cr	Paulding Co	10 18 71	28				15,870			
Prairie Cr	Paulding Co	7 11 71	13				42,354			
Scippo Cr	Pickaway Co	3 01 71	25							
Lt Cuyahoga R	Portage Co	8 16 71	31							
Trib Eagle Cr	Preble Co	9 09 71	13				1,723			
Elk Cr	Preble Co	4 21 71	12				486			
Four Mile Cr	Preble Co	9 08 71	13				4,233			
Seven Mile Cr	Preble Co	8 20 71	31							
Seven Mile Cr	Preble Co	1 16 71	31				408			
N Br Yellow Cr	Putnam Co	10 13 71	31							
Riley Cr	Putnam Co	6 08 71	31				8,691			
Tawa Run	Putnam Co	12 07 71	28							
W Black Fork	Richland Co	4 21 71	26				400			
Pond Lick Res	Scioto Co	6 04 71	28				3,403			
J A Thise Ditch	Seneca Co	7 23 71	22							
Morrison Cr	Seneca Co	5 24 71	50				250			
Rock Cr	Seneca Co	7 23 71	13							
Rock Cr	Seneca Co	7 11 71	28				63			
Turtle Cr	Shelby Co	9 04 71	13				148			
Black Run	Stark Co	7 25 71	32				675			
E Br Nimishillen	Stark Co	8 30 71	28				40			
Trib Mahoning R	Stark Co	5 25 71	22				25			
Turkey Foot Ca	Summitt Co	2 19 71	50				94			
Mahoning R	Trumbull Co	1 11 71	26				23			
Lt Stillwater Cr	Tuscarawas Co	8 31 71	41				60,281			
Pleasant Valley	Tuscarawas Co	9 04 71	13				2,600			
Pleasant Valley	Tuscarawas Co	9 11 71	13				2,536			
Mill Cr	Union Co	9 03 71	42				1,795			
Newmans Run	Warren Co	7 02 71	13				7,592			
Ritters Cr	Warren Co	6 14 71	13				118			
Shaker Cr	Warren Co	9 14 71	50				1,505			
Trib Lt Miami R	Warren Co	3 22 71	22				686	3		
Duck Cr	Washington Co	8 30 71	21				47,250			
Siegel Ditch	Williams Co	3 02 71	42				56			
Spring Run	Wyandot Co	4 17 71	31							
OKLAHOMA										
Skeleton Cr	Enid	1 12 71	25	9	91		22,818	3	62M	14
Cottonwood Cr	Guthrie	2 06 71	42	2	98		35,040	2	7M	
N Canadian R	Oklahoma City	11 03 71	31	4	96		500	4	35M	
N Canadian R	Oklahoma City	8 16 71	24	1	99		171,370	2	8M	2
Walnut Cr	Purcell	9 12 71	31	2	98		2,219	2	2A	1
Manabee Cr	Shattuck	6 12 71	11	7	93		572		1M	2
N Canadian R	Watonga	7 31 71	31	1	99		132,769		2M	1
OREGON										
Ashland Creek	Ashland	9 09 71	33	100			200	2	1M	4
Refrigerator Cr	Crescent Lake	2 10 71	41	100			1,050	2	2M	3
Gilbert Creek	Grants Pass	7 20 71	11	100			36	3	1M	2
Applegate River	Murphy	7 28 71	11	100			100	1	1M	1
PENNSYLVANIA										
Monogahela River	Belle Vernon	7 31 71	50	13	87		3,450	4	18M	2
Hay Creek	Birdsboro	8 31 71	41	8	92		56,964	1	5M	24
Susquehanna Riv	Bloomsburg	9 12 71	31	20	80		25,054	2	3M	
Tunungwant Creek	Bradford	8 06 71	24	33	67		52,980	1	3M	
Monocacy Creek	Brodhead	10 17 71	21	100			40	1	1M	6
Monocacy Creek	Brodhead	9 07 71	21	100			18	1	1M	3
Monocacy Creek	Brodhead	7 30 71	21	100			500	2	1M	12
Monocacy Creek	Brodhead	7 24 71	21	100			100	2	4M	3
Fishing Creek	Columbia Co	7 23 71	11	27	73		7,324	1	18M	
Conneaut Creek	Conneautville	5 16 71	24	30	90		100,000	1	1M	5
Trib-Whitney Run	Corry	9 12 71	13	100			500	3	1M	24
Tr E Br Brndywin	Dowington	6 14 71	42	50	50		200	4	7M	7
Narrows Creek	Dubois	3 14 71	25	10	90		2,500	2	1M	1
Lt Loyalsock Cr	Dushore	7 10 71	22	10	90		4,074	1	3M	3
Sambo Creek	E Stroudsburg	9 03 71	50	10	90		32,081	2	6M	8
Bonnie Brook	East Butler	1 16 71	24	1	99		1,066	2	1M	
Driftwood Branch	Emporium	8 19 71	33	50	50		12	4	3M	6
Trib-Raystown	Everett	4 18 71	25	100			100	4	1M	1
Cole Creek	Farmers Valley	11 12 71	25	25	75		456	4	1M	
Willow Creek	Fleetwood	4 20 71	31	10	90					

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause - see code page 32	Type of fish killed		Percent kill with commercial value	Estimated fish killed	Severity - see code page 32	Estimated miles or acres affected	Duration Days	Hrs.
				Percent game	Percent non-game						
Smith Run	Franklin	1 07 71	28								
Beach Run	Fredricksburg	9 17 71	50	10	100						
Garland Run	Garland	8 24 71	26	50	50		100	4	1M	3	
Jacobs Run	Tarpedo						200	2	1M	4	
Kersher Creek	Graysville	3 19 71	44	100			500				
Soucon Creek	Hamburg	10 01 71	42	2	98		1,129	2	3M	3	
Trib-Thorn Creek	Hellertown	3 30 71	21				100	2	1M	24	
Spring Creek	Herman	5 24 71	25				1,440	2	4M	3	
Towamencin Creek	Kulpsville	4 28 71	24	47	100		6,140	2	2M	2	
Spring Creek	Lewistown	6 27 71	31	25	75		3,000	2	5M	26	
Muddy Run	Limestoneville	1 11 71	25	10	90		112	4	1M	1	
Breakneck Creek	Mars	8 18 71	42	75	25		3,000	1	1M	1	
Breakneck Creek	Mars	12 17 71	24	25	75		11,773	1	2M	3	
Ten Mile Creek	Mather	4 17 71	24	20	80		5,404	2	5M	3	
Ten Mile Creek	Mather	9 13 71	31	50	50			1	3M	4	
Mauses Creek	Mather	7 08 71	21	10	90		250	4	2M	2	
French Creek	Mausedale	9 25 71	24	40	60		300	2	2M	2	
Van Horne Creek	Meadville	7 22 71	24	10	90		350,000	2	6M	2	
Trib to Pine Run	Merwin	10 13 71	31	50	50		1,200	2	1M	1	
Swatara Creek	Middletown	10 07 71	24	100			1,000	1	3M	3	
Moscow Reservoir	Moscow	3 12 71	24	33	1	99	15,000	2	30A	2	10
Mountain Creek	Mt Holly Springs	10 28 71	33	11	70	30	9,287	1	9M	2	24
Lt Chickies Cr	Mt Joy	12 20 71	13	20	80		5,407	1	6M	3	
Lt Chickies Cr	Mt Joy	5 15 71	31	50	50		1,662	2	3M	3	6
Breakneck Creek	Myoma-Butler Co	7 14 71	24	20	80		2,282	2	1M	1	
Lt Juniata Creek	New Bloomfield	9 02 71	50	90	10		3,000	1	1M	1	
Unk Trib-Big Run	New Castle	8 31 71	50				300	1	2M	2	
Allegheny River	Oakmount	7 15 71	21	2	98		20,000	2	30M	4	
Wolfkill Run	Petroleum Centr	5 12 71	44	1	99		212	2	3M	3	
Mahoning Creek	Punxsutawney	8 19 71	26	7	93		8,292	2	4M	4	
Mahoning Creek	Punxsutawney	6 09 71	31	10	90		2,000	3	1M	2	
Campbells Run	S Centre Twp	9 15 71	12				150	3	4M	2	
Trib to Thorn Cr	Saxonburg	6 26 71	27	1	99		10,336	2	2M	2	
Cayuta Creek	Sayre	7 30 71	31	20	80		16,476	1	4M	5	
Honey Creek	Siglerville	9 07 71	34	40	60		80	4	1M	2	
Lackawanna River	Simpson	7 29 71	26	20	80		2,750	2	2M	6	
Big Trout Run	Slatington	10 22 71	42	25	75		34,447	1	2M	6	
Run-Trib Gitts R	Smith Station	7 16 71	28	25	75		6,777	1	2M	6	
Coxes Creek	Somerset	9 09 71	25	10	90		1,120	3	3M	1	4
Muncy Creek	Sonestown	8 11 71	50	10	90		3,500	2	6M	2	
Conneaut Creek	Springboro	7 25 71	42	25	75		26,000	2	3M	1	
Valley Run	Union City	10 04 71	50	25	75		3,500	1	12M	1	12
So Br French Cr	Wakefield	6 08 71	42	40	60		189,166	2	2M	8	
Connonwingo Creek	West Mifflin	7 10 71	50	20	80		2,016	2	1M	3	
Monongahela Riv	Westfield	7 14 71	26	100			1,110	2	1M	3	
Cowanessque River	Westfield	6 04 71	28				1,625	2	2M	1	
Cowanessque River	Westfield	7 14 71	26	100			8,000	1	2M	5	6
Trib-Pennypack C	Westfield	11 01 71	25	100			220	4	1M	2	
Wind Gap Branch	Willow Grove	9 12 71	50	50	50		15,388	2	2M	2	
Wallace Run	Wingate	7 28 71	50	1	99			4	1M	2	
Susquehanna Riv	York Haven	2 04 71	50	100				2	2M	2	
RHODE ISLAND											
Point Judith Pd	Wakefield	8 05 71	24				200	4	1M	2	4
Pawtuxet River	West Warwick	7 29 71	28				100				
SOUTH CAROLINA											
Fishing Creek	Rock Hill	6 29 71	31	10	90			3			
SOUTH DAKOTA											
Roderick Dam	Artesian	5 01 71	11				5,000	2	10A	3	
Spit Rock Creek	Corson	6 05 71	13	20	80	100	300	2	3M	2	
Rapid Creek	Rapid City	8 10 71	31	100			5,000	2	3M	2	
TENNESSEE											
Comstock Creek	Bethesda	8 10 71	11	10	90		10,787	2	1M	12	
White Horn Creek	Bulls Gap	5 21 71	41	1	99		45,198	4	3M	1	
Dale Hollow Lake	Byrdstown	8 01 71	21	2	98		2,000	4	1A	1	2
S Holt Fish Farm	Centerville	6 23 71	28				1,000	2	1M	3	6
Tumbling Creek	Ernestville	6 28 71	42	1	99	100	1,025	4	3M	2	
Norris Creek	Fayetteville	6 09 71	13	7	93		33,486	2	2M	1	
Caney Creek	Forbus	8 21 71	21	3	97		1,618	2	2M	1	
Sinking Creek	Johnson City	5 13 71	24	1	99		22,272	3	2M	2	
Hurricane Creek	Lavergne	5 05 71	28	70	30		200	4	1M	3	
Rock Creek	Lewisburg	5 31 71	31	100			31,728	2	4M	6	
Gibson Creek	Madison	2 26 71	31	60	40		18,255	2	4A	1	6
Stones R-W Fork	Murfreesboro	9 01 71	31	19	81		10,197	2	1M	3	
Stones R-W Fork	Murfreesboro	10 02 71	31	80	20		95	4	2M	2	
Melton Hill Lake	Oak Ridge	7 01 71	31	100			98,842	3	2M	2	
Garrison Fork Cr	Wartrace	9 11 71	24	2	98		9,486	3	1M	2	
Trace Creek	Waverly	10 26 71	31	4	96			3	2M	2	
TEXAS											
Mustang Bayou	Alvin	2 04 71	50	5	95	10	200	1	4M	2	
Trinity River	Anahuac	7 15 71	31	5	95	80	3,000,000	1	5M	1	
Black Duck Bay	Raytown	7 02 71	31				2,000	2	3M	3	
Hillebrant Bayou	Beaumont	8 04 71	31	80	20		1,000	3	2M	3	
Nolan Creek	Beilton	4 17 71	31	30	70		5,000	1	3M	3	

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause - see code page 32	Type of fish killed			Estimated fish killed	Severity - see code page 32	Estimated miles or acres affected	Days	Dnratio Mrs.
				Percent game	Percent non-game	Percent kill with commercial value					
San Bernard Riv.	Brazoria	6 04 71	50		100		1 000	4	1M	1	
Pecan Bayou	Brownwood	5 30 71	31								
Crystal Creek	Conroe	7 29 71	25								
Crystal Creek	Conroe	7 09 71	25	10	90		2 000	2	2M	4	
Ship Channel C.C.	Corpus Christi	6 15 71	44	50	50		500	4			
Rio Grande River	Dickinson	8 08 71	50	6	94		1 800	3	4M	4	
Dickinson Bayou	Dickinson	8 25 71	31	5	95	80	4 000 000	2	5M	5	
Dickinson Bayou	Dickinson	7 07 71	31	10	90	50	2 000 000	1	5M	1	
Dickinson Bayou	Dickinson	8 16 71	31	5	95	85	3 000 000	2	3M	1	
Magnolia Bayou	Dickinson	8 24 71	31	5	95	90	1 000	2	1M	1	
East Union Bayou	Freeport	5 28 71	31	2	98	2	2 350	2	1M	1	
Freeport Harbor	Freeport	10 06 71	50	30	70	60	105 600	2	2M	1	
Old Oyster Creek	Freeport	7 07 71	50	1	99		1 000	3	3M	1	
Clear Creek	Friendswood	3 03 71	24	80	20		1 400	1	5M		
Salt Creek	Graham	3 29 71	31	10	90		400	1	4M		
Bee Creek	Granbury	4 25 71	28	5	95		500	4	2M		8
North Bosque Riv.	Iredell	4 24 71	50	30	70		4 000	2	2M	3	
Kings Creek	Kaufman	8 21 71	31	35	65	35			2M	4	
Johnson Creek	Kerrville	3 15 71	11	5	95		300	4	1M	1	
Clear Creek	League City	8 05 71	31				3 000	3	1M	2	
Day Lake	Liberty	6 01 71	25	100	50		100	4	1M	1	
Cedar Bayou	Mont Belvieu	2 11 71	50	1	99	30	14 000	1	11M	1	
Arkansas River	Rockport	9 16 71	50	70	30		1 000	4	269M	7	
Trinity River	Rosser	5 19 71	31	35	65	50	500 000	2			
Sabinal River	Sabinal	7 24 71	13	50	50		1 000	3			
Cibolo Creek	San Antonio	9 08 71	50	100			3 000	4			
Leon Creek	San Antonio	5 03 71	26	100			200	4	1M	1	
San Antonio R.	San Antonio	1 11 71	24	10	90		100 000	2	2M		
San Antonio Riv.	San Antonio	7 12 71	24	10	90		200	4			
Woodlawn Lake	Shoreacres	6 17 71	31	10	90	75	300 000	2	2M	1	
Taylor Bayou	Shoreacres	7 15 71	31	100			50	4	1M	2	
Taylor Bayou	Shoreacres	5 06 71	31					3	2M	1	
Drainage Canal	Texas City	7 22 71	31	100	100		150 000	2	1M		
Texas City Harbr.	Texas City	10 08 71	27	100	10		700	4	5M	1	
Texas City Harbr.	Texas City	9 27 71	27	3	97	90	5 000	2	10A	1	
Mission River	Woodsboro	8 08 71	11	100			2 500	4			
VERMONT											
Waloomsac River	Bennington	7 12 71	24	30	70		25 000	1	4M		5
Whetstone Brook	Brattleboro	8 24 71	24	100			3 000	1	1M		
Dog River	Northfield	7 28 71	31	25	75		10 000	2	2M		6
Black River	Springfield	7 20 71	24	1	99		2 500	3	2M		12
VIRGINIA											
Private Pond	Accomac	6 23 71	11	100			60	3	1A	20	
Little Otter R.	Bedford	12 12 71	28	50	50		1 200	2	22M	3	
Broad Run	Chantilly	7 31 71	50					4			
Occoquan Res.	Fairfax	6 29 71	32	70	30		9 310	2	4M	3	
Private Pond	Glenallen	5 09 71	33	100			1 100	2	16A	4	
N Fk Holston R.	Saltville	7 13 71	24	65	35		20 788	2	8M	2	
N Fk Holston R.	Saltville	8 28 71	24	95	5		2 306	2			
Tr Sf Shenandoah	Shuler	5 05 71	28	100			300	4	1M	1	
Wolf Cr.	South Hill	8 17 71	13	100				4	1A	1	
Nansemond R.	Suffolk	9 08 71	31	1	99			2	1M	1	
Private Pond	Tallysille	5 - 71	50	100			12 077	2	3A	1	
WASHINGTON											
Puget Sound	Anacortes	6 29 71	25					2	5M	30	
Beaver Creek	Bellingham	4 01 71	28	100				2	3M	99	
Chehalis River	Cosmopolis	5 03 71	28		100		100	4	1A	1	
Lake Creek	Forks	7 15 71	50	100			27	2	1M	2	
Cooke Creek	Kittitas	7 01 71	11		100						
Coal Creek	Longview	2 07 71	50	10	90		500	3	1M	2	
Capitol Lake	Olympia	6 22 71	50		100		500	3	6A	1	
Snake River	Pasco	4 - 71	50	100			5 011 400	2	70M	99	
Columbia River	Plymouth	5 26 71	35	100			100	4	1A		
Lake Sammamish	Redmond	2 08 71	28	60	40		150	4	1A	1	
Cedar River	Renton	8 20 71	28	100			50	4	1M	1	
Cowlitz River	Salkum	4 03 71	28	100				3	1M	1	
Lake Washington	Seattle	6 01 71	24	100			1 000	3	1A	2	
Mathews Creek	Seattle	6 29 71	50	100			1 000	3	1A	1	
WEST VIRGINIA											
Glade Creek	Beckley	6 07 71	31	100			125	3		1	
Buckhannon River	Buckhannon	7 10 71	21	30	70		22 500	1	6M	2	
Middle Fk Tygart	Cassity	6 22 71	21	50	50		1 500	1	3M	3	
Greenbrier River	Durbin	4 20 71	28	18	82		120 547	1	18M		8
Ohio River	New Martinsvill	7 09 71	24	5	95	4	5 000	3			
Charles Creek	Richwood	6 25 71	50		100		100	4	1M	1	
Guyandotte River	Stephenson	8 19 71	42	10	90		10 121	2	13M	2	
West Fork	Walkersville	8 28 71	28	10	90		500	2	2M		2
Toms Fork	West Union	8 03 71	42	20	80		14 779	2	1M	1	
Polk Cr-West Fk	Weston	6 07 71	21	70	30		23 000	2	3M	2	
Poplar Fork	Winfield	8 02 71	25	70	30		7 882	2	1M	1	
Private Ponds	Winfield	5 14 71	35	10	90		3 000	2	3A	1	
WISCONSIN											
Thompson Valley	Augusta	8 06 71	22	5	95		1 000	1	4M		15
Drainage Ditch	Bancroft	8 14 71	11	90	10		125	2	2M	2	
Isabelle Creek	Ellsworth	5 06 71	31	100			30	3	5M	2	

TABLE 10—Report of Fish Kills, 1971—Cause Identified—Continued

Body of water	City or town	Date	Cause ¹ see code page 32	Type of fish killed			Estimated fish killed	Severity ² see code page 32	Esti- mated miles or acres affected ³	Days Duration	Hrs.
				Percent game	Percent non- game	Percent kill with com- mercial value					
Milwaukee River.....	Grafton	1 20 71	28	1	99		1,500	4	1M	1	
Rock Creek.....	Lake Mills	5 04 71	12	2	98			2	4M	1	
Pine River.....	Richland Center	6 29 71	31		98		2,000	2	5M	1	
Trib-Narrows Cr.....	Rock Springs	8 22 71	13	64	36		125	2	5M	1	
Echo Lake-Oneida.....	Sugar Camp	8 05 71	11	85	15		250	2	30A	6	
WYOMING											
Shoshone River.....	Cody	11 16 71	13	10	90		12,000	1	3M	1	12

CODES¹ CAUSE:

- 10 Agricultural Operations
 - 11 Pesticides (Herbicides, Insecticides, etc.)
 - 12 Fertilizers
 - 13 Manure, Silo, Feedlot Drainage, etc.

20 Industrial Operations

- 21 Mining
- 22 Food & Kindred Products
- 23 Paper & Allied Products
- 24 Chemicals
- 25 Petroleum
- 26 Metals
- 27 Combinations
- 28 Other

² SEVERITY:

- 1 Complete
- 2 Heavy
- 3 Moderate
- 4 Light

30 Municipal Operations

- 31 Sewerage System
- 32 Refuse Disposal
- 33 Water System
- 34 Swimming Pool
- 35 Power

40 Transportation Operations

- 41 Rail
- 42 Truck
- 43 Barge or Boat
- 44 Pipe Line

50 Other Operations

³ ESTIMATED MILES OR ACRES AFFECTED

A = Acres

M = Miles

Table 11 lists individual fish kills with causes not specifically identified.

TABLE 11—Report of Fish Kills, 1971—Cause Not Specifically Identified

Body of water	City or town	Date	Type of fish killed			Estimated fish killed	Severity: see code page 35	Estimated miles or acres affected	Duration Days Hrs.
			Percent game	Percent non-game	Percent kill with commercial value				
CALIFORNIA									
Dominguez Channl.	Carson	8 24 71		100		6,000	4	1M	1 12
Sacramento River	Dunsmuir	7 21 71	100			855	3	6M	1
Unnamed Trib	Mendocino Co	4 21 71	100			20	3		
Salinas River	Monterey	3 27 71		100		800	3	3M	
Lake Merritt	Oakland	5 06 71	50			7,000	2	500A	
Briones Reservoir	Orinda	7 12 71	100	50		3,000	2	1000A	5
San Leandro Bay	San Leandro	6 30 71	100			100	3	25A	1
Fish Harbor-L A	San Pedro	1 22 71	5	95	5	10,100	3	5A	2
Fish Harbor-L A	San Pedro-La Co	10 21 71	5	95		10,000	3		21
COLORADO									
Cedaredge Htchry.	Delta County	8 05 71				40,000			
CONNECTICUT									
Roaring Brook	Glastonbury	5 22 71	100			300	2	2M	
Thames River	Montville	9 15 71		100	100	100,000	2	6M	5
Quinnipiac River	New Haven	9 01 71		100	100	20,000	2	1M	
Muddy River	Plainfield	11 30 71	60	40		300	4	1M	
Moosup River	Plainfield	11 05 71		100		100	4	3M	
Mt Riga Brook	Salisbury	5 06 71	90	10		200	2	1M	
Pine Brook	Wallingford	4 10 71	5	95		2,500	2	1M	
FLORIDA									
Santa Rosa Sound	Brooks Bridge	8 19 71		100	100	900	4	4M	24
E Arm Joes Bayou	Destin	8 10 71				9,000	2	120A	12
E Shore Escambia	Floridatown	6 23 71		100	100	44,000	2	1M	24
Hoffman Bayou	Hoffman Bayou	8 13 71		100	100	25,000	3	6A	24
Saddle Creek	Lakeland	2 01 71	80	20		835	1	1M	1
Myakka Pk-Deep H	Myakka	1 15 71	83	17		1,220	3	1A	
Cinco Bayou	Okaloosa Co	8 20 71		100		350	4	2A	
Cinco Bayou	Okaloosa Co	8 19 71		100		600	4	2A	24
Cinco Bayou	Okaloosa County	8 15 71		100	100	350	4	1A	9
Bass Hole Cove	Santa Rosa Co	9 25 71				3,000,000	2	3M	3
Bass Hole Cove	Santa Rosa Co	6 16 71				400	4	2A	18
Bass Hole Cove	Santa Rosa Co	9 22 71		100		4,500	3	1A	
Bass Hole Cove	Santa Rosa Co	6 18 71		100	100	750	3	1A	18
Bayou Chico	Santa Rosa Co	9 27 71				2,000,000	2	9M	16
Bayou Texar-Esc	Santa Rosa Co	9 22 71		100	100	250	4	2A	24
E Shore-Escambia	Santa Rosa Co	8 22 71				400	4	1M	24
E Shore-Naval Al	Santa Rosa Co	9 30 71				5,500,000	2	1A	24
East Bay-Holley	Santa Rosa Co	9 29 71				350	4	3M	24
Escambia Bay	Santa Rosa Co	9 04 71			100	45	4	2M	24
Escambia Bay	Santa Rosa Co	10 04 71				250,000	2	9M	3
Escambia Bay	Santa Rosa Co	10 08 71				3,500	3		24
Escambia Bay	Santa Rosa Co	9 24 71				150,000	2	4M	24
Escambia Bay	Santa Rosa Co	9 29 71				10,000	3	9M	7
Escambia River	Santa Rosa Co	8 14 71		100	100	2,500	3	7M	
Floridatown Bech	Santa Rosa Co	9 22 71	100			250,000	2	2M	24
Hoffman Bayou	Santa Rosa Co	8 01 71		100	100	200	4	1M	24
Hoffman Bayou	Santa Rosa Co	7 31 71		100	100	1,500	2	6A	
Hoffman Bayou	Santa Rosa Co	8 19 71		100	100	4,500	2	6A	
Hoffman Bayou	Santa Rosa Co	8 20 71				12,500	3	6A	24
Hoffman Bayou	Santa Rosa Co	7 27 71		100		250	4	2A	
Judges Bayou	Santa Rosa Co	9 14 71		100	100	1,750	3	6A	24
Judges Bayou	Santa Rosa Co	10 13 71				2,000,000	2	4A	24
Judges Bayou	Santa Rosa Co	10 11 71				500,000	2	9M	
Judges Bayou-Esc	Santa Rosa Co	7 28 71				2,500,000	2	36A	24
Judges Bayou-Esc	Santa Rosa Co	7 29 71		100	100	2,000,000	2	2M	24
Judges Bayou-Esc	Santa Rosa Co	7 24 71		100	100	9,000	2	640A	
McMillians Bayou	Santa Rosa Co	9 18 71				2,000,000	2	2M	24
Mulatto Bayou	Santa Rosa Co	8 13 71				1,250	3	2A	
Mulatto Bayou	Santa Rosa Co	9 12 71				250,000	2	4A	
Mulatto Bayou	Santa Rosa Co	9 19 71				2,000,000	2	10M	2
Mulatto Bayou	Santa Rosa Co	8 12 71				75,000	2	3A	
Mulatto Bayou-Ca	Santa Rosa Co	9 14 71		100	100	2,000,000	2	4A	24
N Escambia Bay	Santa Rosa Co	9 15 71				2,000,000	2	3A	24
Saltzman Bayou	Santa Rosa Co	7 25 71		100		2,000,000	2	5M	24
Saltzman Bayou	Santa Rosa Co	8 13 71				2,000,000	2	2M	24
Santa Rosa Sound	Santa Rosa Co	8 23 71		100		750,000	2	2M	24
						5,000	3	5M	24
HAWAII									
Pacific Ocean	Barbers Point	1 22 71						1M	1
Ala Moana Pk Ca	Honolulu	3 24 71		100		8,000	2	1M	
Canal-Kuapa Pond	Honolulu	7 26 71		100		75	4	1M	1
Kapalama Dr Ca	Honolulu	4 28 71		100		100	4	1M	
Mariners Cove	Honolulu	4 20 71		100	100	400	4	1M	
Maunaloa Bay	Honolulu	7 01 71		100		500	4	1M	1
Dr Ca Mokuieia	Honolulu County	5 03 71	50	50	50	200	1	2M	3
Ulehuwa Dr Canal	Waianae	8 27 71	44	56	44	180	1	1M	1
Honouliuli Pond	Waipahu	6 29 71	98	2	98	1,200	2		
ILLINOIS									
Indian-Cedar Crs	Abingoon	12 08 71	2	98	3	23,856	2	5M	2
Copper Slough	Champaign	9 15 71	36	64	10	24,215	2	4M	
Mackinaw River	Colfax	9 03 71	3	97	2	63,920	2	2M	
So Br Kishwaukee	Dekalb	10 01 71	1	99	99	11,661	2	1M	
Buckhart Creek	Edinburg	4 10 71	14	86	7	13,165	3	12M	4
So Br Kishwaukee	Genoa	12 06 71	1	99	41	57,671	3	23M	6
So Br Kishwaukee	Kingston	4 28 71	2	98	96	6,683	2	3M	1
Cedar Creek	London Mills	8 03 71	47	53	60	1,518	1	2M	1
Aux Sable Creek	Minooka	6 01 71	1	99	50	22,843	2	1M	4

TABLE 11—Report of Fish Kills, 1971—Cause Not Specifically Identified—Continued

Body of water	City or town	Date	Type of fish killed			Estimated fish killed	Severity: see code page 35	Estimated miles or acres affected	Duration Days Hrs.
			Percent game	Percent non-game	Percent kill with commercial value				
Feather Creek	Muncie	9 29 71	1	99	2	5,649	4	1M	
Otter Creek	Otterville	7 25 71	20	80	42	14,245	2	5M	2
INDIANA									
Pipe Creek	Frankton	8 25 71		100		1,000	3	3M	
Reagan Creek	Mechanicsburg	9 06 71	5	95		152	3		
Ripley Creek	Sunman	7 27 71	5	95		398	2	10M	
KANSAS									
J Redmond Resrvr	Burlington	5 24 71	80	20	80	6,000	4		
Cowskin Creek	Haysville	8 04 71	5	95	20	5,000	1	1M	1
Marion Reservoir	Marion	6 07 71	15	85	40	3,000	1	2M	3
Indian Creek	Overland Park	12 51 71	25	75	35	18,860	4	2M	15
S FK Ninnescah R	Pratt	7 18 71	10	90	10	200	3	2M	2
		5 21 71	15	85	40	7,500	3	5M	18
LOUISIANA									
Bayou Flaggon	Alexandria	6 10 71							
Bayou Gr Caillon	Dulac	8 06 71	50	50	25	3,000	2	3M	
Red River	Hope Villa	9 23 71	20	80	80	1,000	2	3M	6
Bayou Bonfouca	Moncla	2 07 71	25	75	50	5,000	2	11M	
Weeks Bay	Sidell	8 25 91	50	50	20	500	4	15M	1
Westwego Dr Ca	Weeks Island	8 19 71				500	4	1000A	12
	Westwego	7 12 71		100	100	1,000	2	1M	1
MAINE									
Aroostock River	Washburn	6 02 71		100			4		
MARYLAND									
Jones Creek	Baltimore	11 09 71				2,000			
MASSACHUSETTS									
Quahog Pond	West Falmouth	8 04 71	100		100	102	3	7M	48
Mill Creek	Yarmouth	8 21 71		100			2	2M	
MICHIGAN									
Black River	Croswell	6 14 71		100		75	4	2M	1
MISSOURI									
Petite Saline Cr	Booneville	6 12 71							
Beeler Creek	Cabool	4 20 71	40	60		12,750	2	5M	
E Fork Wakenda R	Hardin	6 05 71				1,000	1	2M	
Frene Creek	Hermann	8 12 71	16	84		6,000	3	1M	
Flat Creek	Sedalia	11 28 71	6	94		4,000	2	1M	
Dodge Creek	St Genevieve	7 01 71	20	80			2	3M	
NEBRASKA									
Republican River	Cambridge	6 23 71		100			3	16M	2
Johnson Reservoir	Lexington	6 24 71	94	6		1,275	4	2	2
NEW JERSEY									
Atlantic City Rsr	Absecon	6 08 71	10	90		200	4	1M	1
Whippany River	Cedar Knolls	6 08 71		100		25	4		
Rocky Brook	Hightstown	7 08 71	1	99		30	4	1M	10
N Br Rockaway Cr	Lebanon	4 19 71		100		60	4	1M	12
Lopatcong Creek	Lopatcong Twp	9 06 71		100		50	4	1M	4
Macs Pond	Manasquan	7 19 71				50	4		
Petticoat Brook	Millville	7 22 71				100	4		
Watnong Brook	Morris Plains	5 19 71	2	98		100	3	1M	1
Ottens Canal	North Wildwood	7 10 71		100		100	3	1M	20
Lake Carnegie	Princeton	6 01 71				450	2	13A	10
Lake Riconda	Ringwood Boro	5 02 71	1	99		50	4	4M	
Rahway River	Springfield	7 14 71		100		50	4		
Pohatcong Creek	Washington	7 23 71							
NEW MEXICO									
Pecos River	Artesia	6 24 71	15	85		8,000	1	6A	3
Pecos River	Tererro	7 02 71	100			1,000	2	2M	3
NEW YORK									
Tonawanda Creek	Batavia	8 10 71				200	4	1M	2
Cayuga Creek	Buffalo	6 28 71		100		4,500	3	1M	12
Tioga River	Lindley	9 13 71	20	80		25,000	2	8M	2
Allen Creek	Rochester	7 21 71	30	70		2,000	2	5M	2
Chautauqua Creek	Westfield	10 14 71	1	99		500	3	1M	8
NORTH CAROLINA									
Deep River	Jamestown	6 08 71		75		1,500	3	1M	6
City Lake	Rocky Mount	4 22 71		100		175	4	6A	2
Rocky River	Siler City	7 17 71		100		100		1M	
OHIO									
Trib Jerome Fk	Ashland Co	7 01 71				479			
Four Mile Cr	Athens Co	3 25 71				170			
Auglaize R	Auglaize Co	7 07 71				239			
St Marys R	Auglaize Co	8 09 71				110			
Dicks Cr	Butler Co	8 21 71				1,297			
Todds Fk	Clinton Co	7 30 71				1,207			
Mill Cr	Delaware Co	9 21 71				269			
Trib Hocking R	Fairfield Co	5 23 71				134			
Blacklick Cr	Franklin Co	6 21 71				89			

TABLE 11—Report of Fish Kills, 1971—Cause Not Specifically Identified—Continued

Body of water	City or town	Date	Type of fish killed			Estimated fish killed	Severity: see code page 35	Estimated miles or acres affected	Days Duration
			Percent game	Percent non-game	Percent kill with commercial value				
Scioto R.	Franklin Co	7 30 71				5,000			
Old Town Run	Greene Co	7 31 71				3,218			
Shawnee Cr	Greene Co	4 13 71				60			
Lt Miami River	Hamilton Co	4 26 71				1,419			
W Fk Mill Cr	Hamilton Co	7 18 71				275			
Grand R	Lake Co	9 16 71				815			
Trib French Cr	Lorain Co	5 04 71							
Wahoo Run	Madison Co	9 30 71				98			
Trib St Marys R	Mercer Co	10 06 71				30			
Great Miami R	Miami Co	9 10 71				111			
Great Miami R	Montgomery Co	9 22 71				100			
Great Miami R	Montgomery Co	5 24 71				21,870			
Muskingum R	Morgan Co	12 28 71				1,000			
Trib W Branch	Morrow Co	10 27 71				31			
Muskingum R	Muskingum Co	10 01 71				85,809			
Seven Mile Cr	Preble Co	8 20 71				1,721			
Loraine Cr	Shelby Co	4 06 71				275			
Nine Mile Cr	Shelby Co	9 06 71				46			
W Br Nimishillen	Stark Co	9 21 71				21			
Mud Run	Summit Co	9 04 71				710			
Newman Run	Warren Co	7 23 71							
		6 22 71							
OKLAHOMA									
Little Sandy Cr	Ada	4 07 71	14	66		2,092	1	3M	
Keystone Res	Cleveland	8 03 71	14	86		37,960	4	3200A	14
Cimarron R	Cushing	6 03 71	6	84		67,940	2	20M	2
Cimarron R	Perkins	3 15 71	47	53		17,065	3	53M	
PENNSYLVANIA									
Little Pine Cr	Etna	6 05 71		100		750			
Trib-Valley Cr	Exton	10 06 71	30	70		2,950	3	1M	
Powers Run	Johnsonburg	5 22 71	4	96		50	2	2M	90
Buffalo Creek	Lewisburg	8 31 71	20	80		20,634	4	1M	1
Byron Sachs Pond	Mountain Top	7 02 71	100			15	2	2M	2
Tulpehocken Cr	Myerstown	6 29 71	12	88		200	4	1A	4
Iron Run	St Marys	9 03 71	50	50		1,000	2	1M	2
E Mahoning Creek	Troutville	3 23 71	100			150	4	2M	2
Bald Eagle Creek	Tyrone	7 19 71		1		1,000	1	1M	2
Kiwanis Lake	York	6 16 71	100			15	4	1A	2
TENNESSEE									
Hatchie River	Ripley	6 06 71	16	84	15	1,974	2	5M	12
TEXAS									
Oyster Bayou	Anahuac	6 28 71	1	99	99	1,993,200	2	2M	1
Trinity Bay	Baytown	4 26 71	5	95		200	4	1M	1
Hurricane Levee	Freeport	3 24 71	30	70	60	25		3M	
Surfside Beach	Freeport	1 09 71	2	98	2			1M	2
Sun Oil "Slip"	Gilchrist	6 14 71		100	100	1,000,000	2	1M	1
Paluxy River	Glen Rose	7 10 71	50	50		1,200	2	1M	1
Big Creek	Guy	8 08 71	20	80		500	3	5M	
Sulfur Creek	Lampasas	6 04 71	5	95				1M	1
Old River	Mont Belvieu	7 23 71	2	98		400	3	1M	1
Cow Bayou	Massau Bay	9 20 71	100	50		3,500	3	1M	1
Atascosa River	Pleasanton	9 13 71	100			1,000	4	1A	1
Leon Creek	San Antonio	5 14 71	100			100	4	1M	1
San Antonio R	San Antonio	5 07 71	100			300	4	1M	1
San Pedro Creek	San Antonio	5 04 71	100			400	4	1M	1
Oyster Creek	Sugarland	5 14 71	5	95		150	4	1M	4
Bosque River	Waco	5 21 71	50	50	3	5,000	2	1M	2
Lake Arrowhead	Wichita Falls	4 21 71	95	5		300		15A	5
UTAH									
Irrigation Ditch	Provo	7 28 71	100			110	3		
WASHINGTON									
Kelsey Creek	Bellevue	10 28 71	100			50	2	1M	2
Chico Creek	Bremerton	9 02 71							
Lake Tapps	Buckley	6 20 71	5	95		3,000	3	1A	1
Puget Sound	Coupeville	10 13 71	90	10			3	1M	4
Ohop Creek	Eatonville	7 23 71	50	50					
Stevens Creek	Humtulsips	7 14 71	100						
Mill Creek	Kent	9 08 71	3	97		5,716	4	1M	1
Clarks Creek	Puyallup	3 25 71	50	50		100	2	4M	1
Lake Sammamish	Redmond	2 04 71	90	10		100	4		
Black River	Benton	2 02 71	25	75		100			
Becker Creek	Ryderwood	4 27 71	100						
Shelton Creek	Shelton	10 05 71	90	10		100	2	9M	99
Shelton Creek	Shelton	7 29 71	90	10		300	2	1M	1
Shelton Creek	Shelton	10 12 71	90	10		20	4	1M	1
Peone Creek	Spokane	10 22 71	32	68		914	2	2M	1
Cowiche Creek	Yakima	8 09 71	3	97		1,434	2	2M	1
Spring Creek	Yakima	3 24 71	5	95			4	1M	1
WEST VIRGINIA									
Kanawha River	Charleston	9 05 71	90	10		1,000	3	3M	1
WISCONSIN									
Wolf River	Stanley	6 18 71	10	90		1,500	1	1M	

CODES

1 SEVERITY:
1 Complete
2 Heavy
3 Moderate
4 Light

2 ESTIMATED MILES OR ACRES AFFECTED
A = Acres
M = Miles

State Agencies Contributing to this Report

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